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ABSTRACT

This literature review and bibliography resulted from a study to design a method for determining the impact of the computerized problem-oriented medical record (POMR) on the nursing components of patient care. The POMR is a system for the documentation of patient care consisting of four related components: a data base, problem list, initial plans for each problem, and progress notes, including information assessment and any revisions of the plan. The bibliography is designed to assist in determining the areas in which the problem-oriented record can assist, and the areas in which further development is required. The literature is reviewed in five categories: (1) the nursing process; (2) the POMR; (3) nursing and the POMR; (4) the computerized POMR; and (5) nursing and the computerized POMR. The bibliography of 680 items is divided into two sections: the nursing process and the problem oriented record and/or system. Access is provided by content area and an author index. (Author/KP)

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The Problem Oriented System: A Literature Review

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FOREWORD

This bibliography was compiled as part of a study to design a method for determining the impact of the computerized problem-oriented record on the nursing components of patient care. The literature review is based on the system approach, which attempts to compare the nursing process approach and the problem-solving approach of the problem-oriented medical record system. The bibliography enhances the capability of determining the areas in which the problem-oriented record can assist, and the areas in which further development is required, in order to generate the information necessary for providing optimum care for the clients of nursing services.

This publication is the third volume in the Nurse Planing Information Series. The series is composed of several selected monographs and bibliographies relevant to health planning. Each publication in this series has been developed under contract with the Division of Nursing, Health Resources Administration, U.S. Public Health Service, or as an information source by the Nursing Component of the National Health Planning Information Center (NHPIC).

The Nursing Component of NHPIC provides health planners with a centralized, comprehensive source of information on nurse manpower planning to facilitate an improved health care delivery system in the United States. The Component acquires, screens, synthesizes, disseminates, and makes available specialized documentary material on nursing, as well as methodological information on a wide variety of topics relevant to health planning and resources development. The first two volumes in this series are: Accountability: Its Meaning and Its Relevance to the Health Care Field and Nursing Involvement in the Health Planning Process.

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Director
Division of Nursing

PREFACE

This literature review is based on the concepts that underlie a general systems approach to goal-directed activity. The selection and synthesis of bibliographic references is intended to provide the coherence necessary for identifying the similarities and differences between nursing process (including problem-solving approaches used by nurses) and Lawrence Weed's problem-oriented medical record (based on problem-solving techniques).

The rapid rise in popularity of the problem-oriented medical record and its increasing use by nurses has provided a political lever for attaining approval for the entry of nurses' notes on the clinical record. The problem-oriented record has also inspired a dramatic advance by providing a logical method for organizing information on the subject of patient care. The problem-oriented system facilitates clarity in thinking, feedback for audit and education, and the structure necessary for applying the benefits of the computer to the patient's record.

Computerized records can provide valuable assistance for patient care through the ability to link medical data with a specific patient's specific problems. Computerized records can also present a base for determining high-risk populations and for linking information on risks and the efficacy of specific types of care in given populations. The computerized record is able to link patient needs, provider interventions, and patient outcomes, and in this way can provide a powerful tool for nursing research.

The similarities between problem-oriented and nursing process approaches are enticing. The differences between the problem-oriented record, as it currently stands, and the traditional approaches used by nursing are subtle but powerful. The questions which remain with regard to the impact of the computer on the process of providing humanistic care remain unresolved and unresolvable at this stage of development of the system.

The degree of fit possible between the level of differentiation of information appropriate to any given individual patient's care and that possible, even with branching logic, on a computerized system, is still a matter of dispute. The problem-oriented system is claimed to facilitate the collaboration between nursing and medicine. This is an admirable goal, but one which can be achieved only in those settings where the differentiation of the types of problems amenable to the strategies of each has been achieved.

Nurses have traditionally been dedicated to the person as a patient and to the patient as a person. To the nurse, the patient is a person with understandable desires for continual personal growth, one who has merits and strong points as well as medical problems, and who is able to provide defined data base information. The patient is also a person who has ever-changing roles as part of a family and a community, and who may resolve other problems through the successful recording and care of medical ones. Many nurses have decided to accept those parts of the problem-oriented record/system which facilitate the care of their clients and to alter those parts which do not. In any case, the service remains the same for the patient, but the benefits devolve on all concerned.

Effie S. Hanchett, R.N., Ph.D.

ACKNOWLEDGMENTS

This literature review was made possible by a contract from the Division of Nursing of the U.S. Public Health Service. Dr. Eugene Levine, Chief, and Ms. Virginia Saba, Nurse Consultant, both of the Manpower Analysis and Resources Branch, provided the liaison between the Division of Nursing of the U.S. Public Health Service and Miss Patricia Kelly, Director of the Department of Nursing of the Medical Center Hospital of Vermont. Without the generous assistance of the Public Health Service, this work would not have been possible. Mis Kelly offered both the opportunity and the resources of her department to enable the work to be completed.

The personnel of the Given Medical Library of the University or Vermont are owed a debt of gratitude for their generous assistance. A continuously updated bibliography on the problem-oriented system is maintained by this library, and this resource was shared with me. Ms. Sara Nixon, reference librarian, was particularly helpful in answering questions and offering available resources. Ms. Donna Carlson, who directed the many interlibrary loan requests; Mr. David Dudly of the library; and the printing department personnel of the Medical Center Hospital of Vermont, who xeroxed large amounts of material; must also be thanked for their gracious assistance.

Ms Diane Ely, B.S., R.N., assisted with the internal organization of the material and suggested many valuable additions to the contents. Daniel Griffin, of Aspen Systems Corporation and the National Health Planning Information Center, provided valuable assistance in editing the material. Mrs. Suzanne Senesac proofread the material with the precision that results from knowledge, care, and dedication. She was assisted by Ms. Bonnie Wilfore and Mrs. Dorothy Maquire. Finally, Mrs. Janet Burford typed the first draft of the manuscript, while Ms. Janice Dubuque typed the final, camera-ready copy. Both typed and edited large amounts of material despite a great deal of time pressure, with consistent patience, competence, and good humor.

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THE PROBLEM-ORIENTED SYSTEM: A LITERATURE REVIEW

I. INTRODUCTION

This annotated bibliography has been designed to complete a requirement of a U.S. Public Health Service, Division of Nursing, contract (NO1-NU-44126) to design a method to evaluate "the effects of a computerized problem-oriented record on the nursing components of patient care."

The material has been organized into the following areas:

1. Conceptual framework underlying both nursing process and the problem-oriented record.

2. Nursing process.

3. The problem-oriented record:
   a.) Background, philosophy;
   b.) Initiating the problem-oriented record;
   c.) Applications of the problem-oriented record settings;
   d.) Studies regarding the effects of the problem-oriented record;
   e.) Modifications of the problem-oriented record;
   f.) Manuals.

4. Nursing and the problem-oriented record:
   a.) Background, philosophy;
   b.) Applications of the problem-oriented record by nurses;
   c.) Studies regarding the effects of the problem-oriented record as used by nurses;
   d.) Manuals;
   e.) Modifications of the problem-oriented record as used by nurses;
   f.) Nursing process and the problem-oriented record.

5. The computerized problem-oriented record.

6. Nursing and the computerized problem-oriented record.

II. METHODOLOGY FOR THE LITERATURE REVIEW

The search for the literature regarding the problem-oriented record was conducted between October 1974 and December 1975. Two major sources were used. An initial Medlars/Medline search was conducted during October 1974. "The Problem-Oriented Record" does not constitute a heading for this system. As a result, several headings were used, and the titles obtained were scanned ("Browse" command) for the existence of "Problem-Oriented" or "Problem Oriented" in their titles.

The Medlars/Medline headings used were:

NURSING-RECORDS
NURSING-AUDIT
NURSING-CARE
PATIENT-CARE-PLANNING
PROFESSIONAL-STANDARDS-REVIEW-ORGANIZATIONS
PATIENTS
HOSPITAL-NURSING-STAFF
HOSPITAL-NURSING-SERVICE

Of the 1,746 occurrences within these headings, the number of documents in which the title "Problem-Oriented" or "Problem Oriented" occurred was 23. Two documents were located from the off-line search. The reference librarians of the Dana Medical Library at the University of Vermont provided a xeroxed copy of the content listed under "Medical Records" from the Index Medicus Listings. JoAnn Gustafson of the PROMIS Laboratory compiled and maintained an updated list of references on the problem-oriented medical record from these copies. This list of references provided the bulk of the references on the problem-oriented record and/or system which are included in this bibliography.

A later Medlars/Medline search was conducted in March 1977. This was used to update the listing of articles from January 1976 to that time. The title "Problem-Oriented" now exists in that system and was used for this purpose.

The Togas Veterans Administration (Pfifferling 1974) had previously developed a bibliography on the problem-oriented record. Additional references were obtained from this source. Other references were obtained from secondary sources (bibliographies of articles) and from informal sources, such as word of mouth. Foreign language articles and journals were omitted from this review. Compiling a complete list of the literature regarding nursing process and nursing process approaches was not intended.

The heading of Problem-Solving Approaches was considered for all issues of the Cumulative Index to Nursing Literature listed during the time period of 1972 through March-April 1975. This produced listings on both nursing process and problem-oriented approaches. The material on both problem-oriented and nursing process approaches was organized according to content area, and is presented in the "List of Bibliography Items by Content Area" which follows the text of this review. (See p. 85.) Items related to a specific area, but not reviewed in the text, are identified by content area within that list for those who desire more information about a specific content area.

III. CONCEPTUAL FRAMEWORK

A general systems approach to goal-oriented behavior provides a conceptual framework underlying both nursing process and the problem-oriented record. Rosenbleuth and Weiner (1968) defined purposeful behavior as "Behavior oriented toward, or guided by a goal" (Rosenbleuth and Weiner, in Buckley, p. 236).

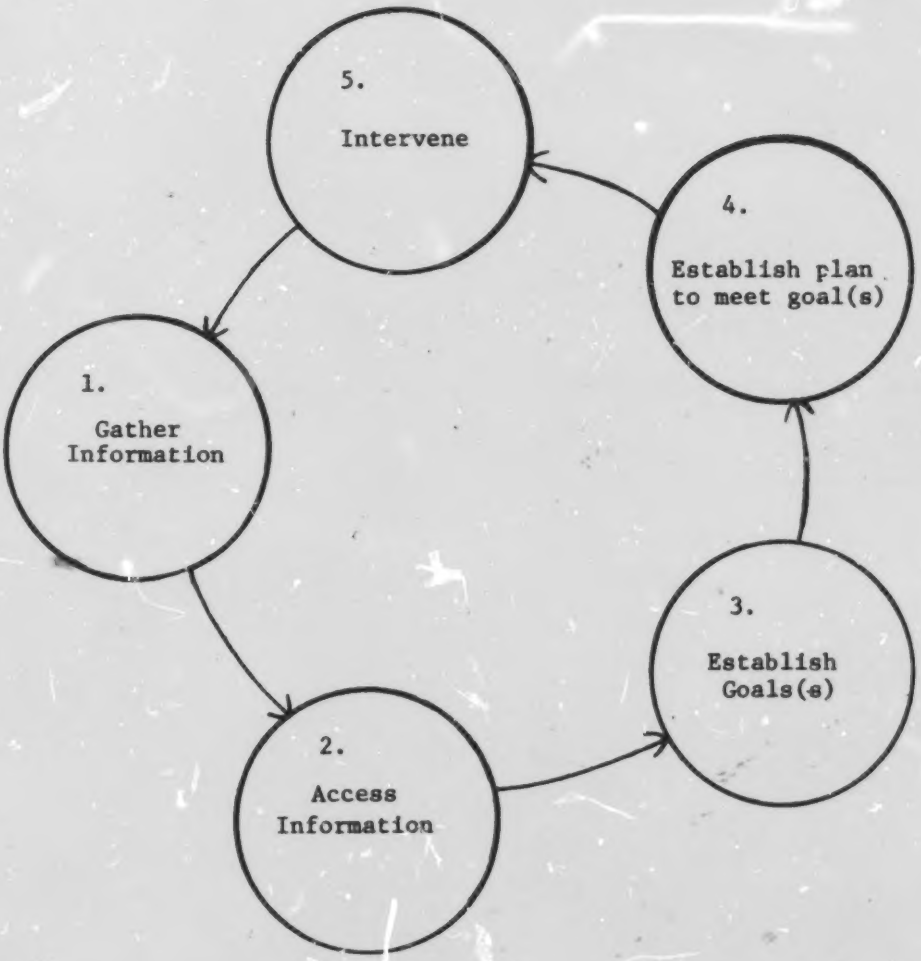
The basic elements of this approach are:

1. Information gathering;
2. Organization of the information gathered into an assessment or diagnosis;
3. Definition of the goal;
4. Establishment of a plan to meet the goal;
5. Intervention, carrying out the action designed to move the system toward the goal.

These steps constitute an interacting cycle of activities (see fig. 1). No one activity occurs alone, and in professional nursing, no one patient factor is considered without evaluating the influence of other factors and the well-being of the patient as a whole.

FIGURE 1

SEQUENCE OF ACTIVITIES IN GOAL-DIRECTED BEHAVIOR



IV. THE LITERATURE

A. NURSING PROCESS

"Nursing process" is the term used to describe those activities of the nurse which are often also described as "problem-solving techniques." It is a conceptual model for differentiation of the nurse's goal-directed activities: data gathering, assessing, planning, intervening, and evaluation. The activities of the nurse, rather than the needs of the client, provide the focus for analysis.

When considered in the context of general systems approaches to goal-directed activities, six discreet concepts must be considered:

1. Information gathering;
2. Assessing the organization of bits of information into meanings;
3. Goal setting;
4. Planning methods to achieve the established goals;
5. Intervening, carrying out the plans made;
6. Evaluating the effects of the interventions in light of the established goals.

Background

Adelaide Nutting and Virginia Henderson stated that the case studies carried out in Annie Goodrich's era at Yale were the beginnings of the nursing process approach. Care planning was included in Henderson's 1939 revision of Harmer's Principles and Practice of Nursing (Henderson 1973).

According to Hawken, Adelaide Nutting admonished nurses to "observe, assess and formulate plans for nursing action" in 1906 (Hawken, in Walker and others 1973, p. 289).

Fry's article, published in 1953, stated that a creative approach to nursing involves a nursing diagnosis and the design and means for carrying out a plan for the care of an individual person (p. 301). She then proceeded to identify five areas of patient's needs, which serve as the basis of nursing diagnoses:

1. Treatment and medication needs;

2. Personal hygiene needs;

3. Environmental needs;

4. Guidance and teaching needs;

5. Human, or self needs.

Her focus was balanced between attention to patient needs and attention to nursing activities to meet these needs.

Abdellah listed five basic elements of nursing in 1957. Several of these closely resemble the basic concepts of the nursing process approach: ability to observe and report signs and symptoms (data gathering), ability to interpret these (assessment), and organization of efforts to assure the desired outcomes (intervention). In addition, she specifically identified the need to analyze nursing problems, including the ability to:

1. Plan for total care,

2. Select a necessary course of action,

3. Help the patient attain a realistic goal.

Five years later, in 1962, Chambers' description of "nursing diagnosis" described these components of the nursing process in a sequence which more closely resembles the one currently in use.

1. Collecting facts,

2. Interpreting facts,

3. Identifying nursing problems,

4. Deciding the course of action,

5. Evaluating results.

Kormorita's list was published the following year (1963). It closely resembles that of Chambers', except that Kormorita added planning to her list of elements of the "nursing diagnosis." The first published account identified in which the term "nursing process," rather than "nursing diagnosis," was used for these elements was Yura and Walsh's account published in 1967.

Bonney and Rothberg (1963, 1967) identified the same elements but organized them into two categories. Nursing diagnosis includes the

identification of individual need, establishment of goals, and selection of appropriate methods. Nursing therapy includes nursing care planning and nursing intervention.

Little and Carnevali (1967, 1969) and Zimmerman and Gohrke (1970) provided similar descriptions of the "nursing process." Yura and Walsh (1967, 1973) listed similar components, but placed more emphasis on environmental ("influencing") factors and nurse-client interactions. Freeman (1970) listed the elements of the nursing process as steps through which community health nursing is conducted.

Daubenmire and King (1973) described nursing process from the focal point of the nurse-client interaction, rather than the nurse's individual problem-solving techniques. Most later approaches differ little from the usual descriptions of the nursing process and include Nicholls (1974), Roy (1975), and Mundinger and Jauron (1975).

Components of the Nursing Process

Individual components of the nursing process have been discussed by a variety of authors. Even though it is recognized that the nursing components of patient care are continuously interacting with each other in the "real world" of professional nursing activity, each will be considered separately.

Information Gathering

There are several approaches to information gathering presented in the literature. They represent a continuum of unstructured through structured (as in the data base of the problem-oriented record) approaches. In Hammond and others' (1966) article of the series "Clinical Inference in Nursing" in Nursing Research, the authors discussed the information-seeking strategies of nurses. Simultaneous and successive scanning patterns are identified for different nurses.

Ujehly (1968) argued that an unstructured approach strengthens the nurse-client interaction. The patient is allowed the freedom to verbalize his concerns according to his own priorities. This approach relies on the nurse's skill in perception of verbal and nonverbal cues to identify the areas in which the patient avoids direct, verbal communication. It also relies on the nurse's communication skill to elicit the information necessary to plan care.

Lewis (1970) stated: "the flexibility of the semistructured interview is one of its prime advantages. It can be adapted to the patient

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and the nurse to allow for free expressions of feelings, attitudes, and beliefs in relation to the patient's life experiences." She offered: "these provide more cues than the mere facts of his life" (p. 42).

McPhetridge (1968) presented a nursing history form with specific questions but stated that this is intended to be used only as a guide. The interviewer is free to rephrase questions and explore different areas to different degrees of depth (p. 69). An additional area is left for "other concerns" (part 3, no. 3). The average time required for this process is 25 minutes. This guide is organized into four areas:

1. Patient perceptions and expectations related to illness/ hospitalization.

2. Specific patient needs. This section provides an excellent base for "tailoring" the patient's needs, and considers factors in perceptual and motor abilities and daily rhythms.

3. Other. This section includes allergies, educational level achieved, and any concerns which the patient may have.

4. Nurse's impressions and suggestions.

A defined data base for rehabilitation patients was developed by Bonney and Rothberg (1963). Specific information in areas of mobility and self-care was identified. Garant (1972) published an assessment guide which includes emotional, spiritual, physical, social, and intellectual components. This is the least structured of the structured format approaches.

Assessment

Hammond (1964) stated: "The complex nature of nursing inferences is based on multiple cues of different levels of quality used to judge the state of the patient." He also suggested that different nurses use different inference patterns.

In a later article in the same series, Hammond (1966) reported the findings of a study conducted to identify single cues or multiple cue groupings which constitute a message unit for the nurses. Although inconclusive, the findings suggest that no single cue held independent significance for any of the six nurses studied. Rather, the data suggest that single cues are organized into cue groupings which constitute a message unit for the nurse. Cue groupings were organized into larger cue configurations. The cue configurations were used differently by each nurse and were likely to provide the basis of her inference.

Durand and Prince (1966) considered nursing diagnosis to be any aspect of the patient's condition that requires nursing care. They

discussed fact gathering and pattern recognition as central to any diagnostic process. Examples of nursing diagnoses are provided. These include physical, psychological, and communication problems. Lewis (1970) included strengths and weaknesses, concepts of meaning, and pattern in her brief discussion of the analysis of data obtained by information gathering (Lewis 1970, pp. 65-66). Yura and Walsh (1973) discussed assessment in terms of knowledge of human needs, human behavior, and characteristics of a helping relationship (p. 79). They also stated that the nurse needs a model of health to serve as a basis for assessment (p. 82). The nurse must also know the major pathologic and psychopathologic insults to a person at various developmental stages (p. 83).

Hamdi and Hutelmyer (1970) present a review of the literature regarding tools for nursing assessment before describing their own study. McCain's "Guide to the Systematic Assessment of the Functional Abilities of the Patient" was modified for diabetics and was pretested with 10 patients. In the experimental phase, the 10 patients were studied. Each was assessed by one nurse who used the experimental assessment tool and by one nurse who did not use the assessment tool.

The experimental group identified fewer of the patient's nursing care problems. However, more of the problems identified through the use of this tool were judged to be validly based on supporting data. The authors did not indicate whether or not their assessors were made aware of the study's criteria of the need for written evidence of supporting data. There was no discussion of the significance of the less "valid" problems which were identified through the unstructured control method.

Goal Setting

Goals or objectives for patient care arise from the goals and values of the nurse in combination with those of the patient. The greater the congruence of goals of both parties, the greater the energies which are available for the pursuit of these goals. Freeman (1970, pp. 62-63) discussed the need for the public health nurse to bring her own goals, the goals of the recipient of her services, and the goals of the broader community into perspective. She differentiated between truly mutual goal setting and securing the compliance of others.

Mauksch and David (1972) included goals within their model of the nursing process and used goals rather than problems as a reference point for both planning and intervention. They stated that goals must be measurable, attainable, reasonable, and representative of the patient's aspirations. The reasons and methods for establishing goals were given by Mager (1962) in his programmed instruction text. He presented the reasons for educational objectives, their qualities

(the communication of the teacher's intent), and the methods for recognizing their achievement (through the initial careful statement of the objective). He also provided instructions for preparing and stating measurable objectives.

Smith (1971) used Mager (1962) as her framework. She argued strongly for the use of behavioral objectives in nursing, and stated: "We must begin to measure in a systematic way what we accomplish for and with patients and we must put this into words that can be understood" (p. 320). She provides examples of specific behavioral objectives and also presents objections to this approach. Smith also stated that objectives are developed from data obtained from the patient as well as from nursing knowledge. She considered objectives to be a series of compromises between ideal and real. The ideal is obtained from nursing's models of health, the real from the constraints provided by patient and environmental resources.

Yura and Walsh (1973) differentiated between immediate, intermediate, and long-range goals in their section on priority setting (p. 96). They describe Maslow's hierarchy of need and Erikson's eight stages of development as frameworks for needs. Zimmerman and Gohrke (1970) presented the concept of "negative goals" or the lack of deterioration as a goal in some situations. One example is the prevention of skin breakdown.

Lewis (1970) considered goals within the context of objectives. She stated: "Nursing objectives describe the intended outcome of the nursing action" (p. 84). She also differentiated between short-term and long-term goals, and between objectives for the patient (the patient will be able to take care of his own colostomy) and objectives for what the nurse will do for the patient (teach colostomy care). Her approach to the latter, based on Mager's concepts, considers specific patient outcomes to be more measurable and therefore to provide better evidence of the success of nursing intervention.

Lewis also discussed "conditional outcomes"--those conditions which are required for a specific outcome to be achieved. She pointed out that although certain general objectives for specific common patient problems may be identified, nursing objectives and evaluation criteria must be personalized to the patient (p. 89).

Little and Carnevali (1969) included consideration of goals throughout the content of their work on nursing care planning. They considered the statement of goals or objectives for nursing action to be an important clarifying element in care plans and stated that they "serve to crystallize the directions, the distance the nurse hopes to help the patient travel, the probable approaches and the measurement of patient responses" (p. 173). They differentiated between short-term and long-term goals and discussed several factors in changing

goals: the progress of the patient, the discovery of contradictions between nurse and client goals, and the constraints of the reality situation.

Little and Carnevali (1969) also spoke of the balance between degrees of specificity of goals--"those which are too specific as to require constant revision, and those which are so vague as to rarely require change" (p. 165). In discussing the teaching of care planning, they stated that teaching the use of stated goals should enable the learner to:

1. Become aware of the value of goals in day-to-day nursing;

2. Perceive the differences between patients' goals and those of the nurse, and the influence that this can have on their interaction;

3. Set achievable goals that foster orderly, logical progression of nursing care measures (p. 228).

Patient goals or objectives are included in Wagner's (1969) description of the essential components of a nursing care plan. She stated: "An objective should get down to basic physiologic or psychologic behavior" in order to provide something to aim at (p. 988). Another characteristic of the care plan which she identifies is "currency." She stated that care plans must be flexible and that "we must, of course, be able to modify our goals and approaches if they do not work, if conditions change, or if continuing study of the patient results in a clearer picture of his problems" (p. 989). She also stated that objectives must be achievable.

Planning

The nursing care plan consists of a conscious statement of the sequence or pattern of activities which will be used to achieve the stated goals. The background of nursing care plans is discussed by Ciuca and also by Henderson.

Ciuca (1972) presented a review of the literature regarding nursing care plans up to the time of her study. This constituted the introduction to her study of the content of nursing care plans. Therefore, her primary objective in this review was to identify the elements included within previous authors' approaches to the care plan. Henderson's (1973) letter to the editor, printed as an article, identified the forerunners of nursing care plans: the "case study" in Jensen's Student Handbook on Nursing Case Studies (1929); A Curriculum Guide for Schools of Nursing (1937); and her own revision of Harmer's The Principles and Practice of Nursing (1939).

Definitions of planning vary from author to author. Many are imbedded in concepts of the other components of nursing care. Rothberg (1967) defined "nursing care plans" as a step toward nursing therapy. She stated that there is absolutely no point in making a nursing diagnosis unless it leads directly to action in the form of nursing therapy. Wagner (1969) defined a nursing care plan as "a written picture of the patient and his nursing care which enables the staff to give him the kind of care he has a right to receive" (Browning and Minehan 1974, p. 239).

Yura and Walsh (1973) stated: "Planning means to determine what can be done to assist the client. The essence of planning includes a deliberate approach to setting precise goals, continually validating the data, establishing priorities, and making decisions about specific measures to resolve his problems" (p. 29). Kramer (1972) stated that there should be only two main purposes for the nursing care plan--to foster continuity and comprehensiveness of patient care (p. 30). Lewis (1970) stated: "The plan is a result of the combined efforts of nurses, patients, family, and other members of the health team to find ways in which nurses can assist the patient with his needs."

Browning and Minehan (1974) presented a collection of articles from the American Journal of Nursing Company's publications regarding the planning of nursing care in section V of their book. The brief introduction to this section states that nursing care plans have been evolving for at least 40 years and as such are the oldest component of the nursing process. The statement was also made that preoccupation with care planning has overshadowed the other elements of the nursing process. Articles concerning benefits, problems, and objections to the care plan are also included.

Lewis (1970) considered several nursing components of patient care under the title "Planning." Her approach is sensitive both to the uniqueness of each patient and to the complexities of the nursing process. She stated that each step of the nursing process (assessment, intervention, and evaluation) influences and is influenced by the others (p. 79). She discussed decisions regarding the timing and sequences of care, the need for modifications of the plan with changing patient conditions, and the formulation of objectives under her consideration of planning. Her definition of approaches is "the nursing activities clustered around a nursing objective" (p. 91). Her discussion of the selection of alternatives (pp. 91-94) includes consideration of the consequence, probability, and desirability of approaches.

Yura and Walsh (1973) consider planning throughout the content of their book. The discreet section on planning (pp. 28-29) addressed this activity within the context of goals and actions. They

stated: "The essence of planning includes a deliberate approach to setting precise goals, both ultimate and proximate, continually validating the data obtained by assessing the client's problems, establishing priorities and making decisions about specific measures to be used to resolve his problems" (p. 29). A later discussion of planning (pp. 93-107) includes priority setting, nursing orders, and the nursing care plan. Yura and Walsh (1973) considered the clearly stated nursing care plan to be the most effective means of assuring the client that his problems will be solved and that his basic human needs will be fulfilled.

Mayers (1972) considered the problem-solving approach as basic to nursing care planning. She included several chapters in her discussion: ch. 3., "The Problem as the Basis for Care Planning;" ch. 4., "The Expected Outcome as a Standard for Evaluation;" ch. 5., "The Nursing Action as the Strategy for Solving Problems;" ch. 6., "The patient's response as a test of Good Planning." Usual and unusual problems provide a recurrent theme in her consideration of patient needs, and a chapter is devoted to standard care routines. She argued that the pendulum is swinging away from the focus on individualized care plans and returning to the middle of the road. It is rational and valid to consider both similarities and differences between clients, she stated.

Assets and liabilities of the nursing care plan were presented by Kramer (1972). She stated her concern that care planning will become an end, rather than a means, for patient care. She felt that this could be resolved by trimming the numerous purposes of the care plan to two basic and functional concerns: (1) the coordination of care and (2) the continuity of care.

Ciuca's (1972) analysis of 235 nursing care plans from 6 hospitals in the San Francisco Bay area shows the content of the nursing care plan to be primarily related to the notation of functional duties (medications, treatments, vital signs, I & O, and diagnostic studies). "Notations indicating the planning of nursing care action were conspicuously absent" (p. 231). Possible reasons for this omission include lack of administrative support, lack of staff skills in this area, and/or a low priority on nursing care planning. It may be that the nursing care plan is not seen as a tool for nursing practice. Adequate consultation and an adequate role model might help to remove this barrier.

Nursing Intervention

Definitions of nursing intervention have been given by many authors. Yura and Walsh (1973) stated: "Implementation involves action; it is the phase in which the nurse initiates and completes

the actions necessary to accomplish defined goals" (p. 20). Lewis (1970) stated: "Nursing actions test the hypotheses posed in the planning state." She also enumerated specific types of nursing action in the chapter of her book, "Intervention--Nursing Action" (pp. 109-117). Freeman (1970) described mobilizing available resources for care as one of the elements of the community nursing process (p. 65). Mayers (1972) defined a nursing action as a "specifically recommended, individualized nursing activity designed to solve the patient's problem by a projected point in time." She stated that several nursing actions may be necessary for the solution of one problem (p. 81).

Attempts to list or to identify nursing activities often become bogged down within the complex levels of nursing intervention. Abdellah's "21 Nursing Problems" (1960) provides one approach. Gebbie and Lavin's (1974) and Roy's (1975) attempts to establish a consistent nomenclature for nursing diagnosis constitute another approach. Literature regarding nursing intervention itself would necessarily include review of all the basic texts on nursing care and is not relevant to the purposes of this review.

Evaluation

The evaluation component of nursing care is a combination of both the information-gathering and the information-organizing components. This is done both concurrently with and after the completion of the other components of nursing care.

Yura and Walsh (1973) considered evaluation as one of the nursing components of patient care and stated: "evaluation means to appraise the client's behavioral changes due to the actions of the nurse" (p. 30). They considered it to be the fourth component of the nursing process which follows the implementation of actions designated in the nursing care plan (p. 120). They included nurse, client, and family as agents of evaluation.

Lewis (1970) considered evaluation to be the final step in the nursing process. She differentiated between the evaluation of patient care and the evaluation of the nursing care plan (pp. 118-122). However, she considered ongoing appraisal within her chapter on data collection and suggested the selection of relevant indicators of change (pp. 51-53). In her earlier article (1968), Lewis stated that evaluation determines to what extent the care given is successful in meeting the patient's needs (p. 27). Zimmer (1974) stated that assessment of outcomes of care is a powerful means for quality assurance (p. 317).

Daubenmire and King (1973), referring to their interpersonal model, stated that the nursing process is a dymanic, ongoing, inter-

personal process dependent on the changing behavior of patient and nurse, and that the nurse must be continuously observing and measuring the changing behavior of both nurse and patient (p. 516).

Hammond (Fall 1964), in his witty but meaningful description of the wood tick's behavior, differentiated between the wood tick, which responds in a single fashion to a single cue, and the nurse, who responds in a complex fashion to complex cues.

There are two systems for evaluation: the patient's signal-sending system and the nurse's signal-receiving system (p. 317). Central questions for evaluation of the state of the patient are:

1. Has the patient moved closer to achieving the next developmental goal?

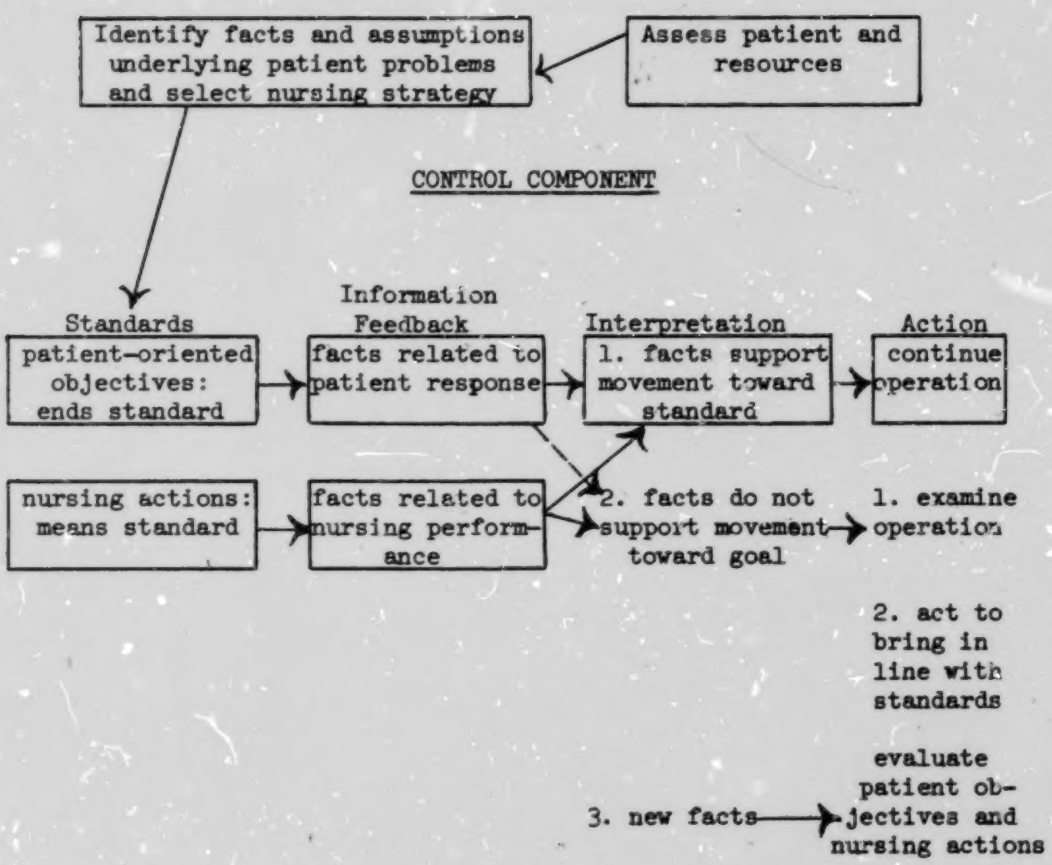
2. What are the costs of this movement (pain, discomfort, instability, and/or loss of previous developmental accomplishment)?

3. What quantity, quality, and time patterns for the provision of necessary resources have been most effective and least costly to the client and his significant others?

Nicholls (1974) presented the following model (p. 216) describing the process in which changing patient needs result in changing cues and actions to maintain a system of care which is congruent with patient needs. When a nursing care plan changes in response to a patient's needs, the standards, feedback system, and actions to maintain performance also change.

FIGURE 2

NICHOLLS' MODEL FOR
MAINTENANCE OF CONGRUENCE OF NURSING CARE
IN RELATIONSHIP TO PATIENTS' NEEDS


Identify facts and assumptions underlying patient problems and select nursing strategy
Assess patient and resources
CONTROL COMPONENT
Standards
Information Feedback
Interpretation
Action
patient-oriented objectives: ends standard
facts related to patient response
1. facts support movement toward standard
continue operation
nursing actions: means standard
facts related to nursing performance
2. facts do not support movement toward goal
1. examine operation
2. act to bring in line with standards
3. new facts
evaluate patient objectives and nursing actions

Summary

In summary, the concept of nursing process is closely related to a general systems approach to goal-directed behavior. Although nursing process provides a systematic method for analysis of the activities of the nurse, one should be aware that it does not provide a method for analysis of the needs of the client of nursing services. It has developed from the early approaches to planning nursing care which were developed during the 1930's at Yale. Each of the elements of the nursing process overlap and interact with the others in the real world applications of nursing care. However, differentiation of each component should eventually result in clarification of their interrelationships.

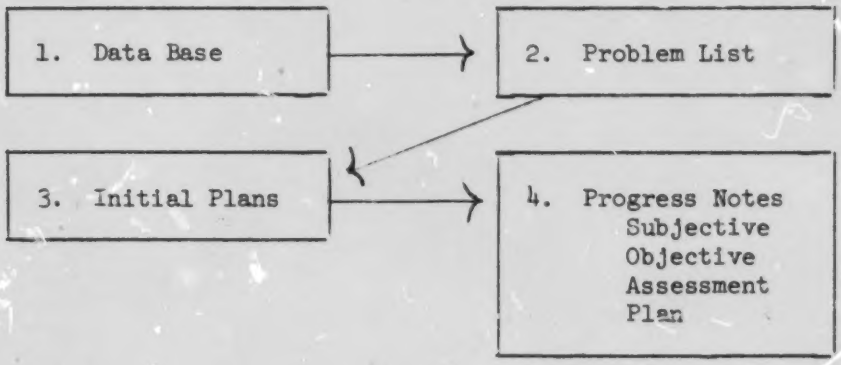
B. THE PROBLEM-ORIENTED MEDICAL RECORD (POMR)

Introduction

The problem-oriented medical record is a system for the documentation of patient care. It was first presented by Dr. Lawrence Weed in the mid-1960's (Weed 1964). Essentially, it consists of four components of the medical record.

FIGURE 3

THE FOUR COMPONENTS OF THE PROBLEM-ORIENTED MEDICAL RECORD



These four components are the basis of the problem-oriented approach. In addition, the inclusion of a flow sheet is often presented. The four components consist of:

1. Data base.--This element provides the method and form for gathering information about the patient.

2. Problem list.--This list is the result of organizing the information gathered into meanings, the list of defined patient problems. Some authors have discussed the value of adding a list of assets or resources.

3. Initial plans.--An initial plan for each problem is included in the problem-oriented record (further plans are to be included within each progress note). According to this system, initial plans are made for each problem identified. However, a valid initial plan might be that of "no intervention appropriate at this time."

4. Progress notes.--This note provides a method for dealing with the ongoing response of patients and allows for the revision of the provider's assessment and plan. It includes the following elements in its often cited "SOAP" note:

   - Subjective indicators of the patient's condition;
   - Objective indicators of the patient's condition;

- Assessment of this information;

- Plan, based on the revised or reconfirmed assessment.

The initial, basic value of the problem-oriented record is that of organizing the information in a patient record. The chaos of the previous "source-oriented record" is frequently cited throughout the literature.

Other frequently cited assets of the problem-oriented record are that it:

1. Enhances interdisciplinary communication,

2. Facilitates sharing of information with the patients (they can be given a problem list),

3. Facilitates accountability to clients and third-party payers,

4. Enables audit (within the medical or nursing profession).

Many of the same principles apply in the problem-oriented record as in nursing process approaches. Both are, in essence, methods of structuring information toward more efficient goal-directed behavior.

The problem-oriented record provides the basis for a larger, more comprehensive, problem-oriented system of which the problem-oriented record is one component (or subsystem). This more comprehensive approach is described by Walker, Hurst, and Woody in an article in their book, Applying the Problem-Oriented System. It includes principles of practice, the problem-oriented record, audit, and educational programs (pp. 231-49). There is a considerable amount of overlapping of the terms and concepts throughout the literature as the record system grew to include a more comprehensive approach. Prescribed rules and principles of practice were added to the use of the record and developed into a comprehensive system for the provision of patient care. Consequently, it was not feasible, nor was it the intent of this review, to organize the literature from this point of view. Therefore, for the purposes of this review, the term "problem-oriented system" is used to describe all phases of development of the problem-oriented record:

1. The problem-oriented record as a system;

2. The problem-oriented record as facilitator for audit and education;

3. The need for a defined data base, for rules, and finally, for "principles of practice;"

4. The problem-oriented record system, including principles of practice, the problem-oriented record, audit, and education.

Background

The beginnings of the problem-oriented system were published by Weed in the Irish Journal of Medical Science in 1964. In this article, Weed presented the need for standards of uniformity and completeness in the medical record and "rules" for order and discipline of the medical record which resemble the later components of the POMR (Weed 1964).

Basic themes that recur throughout the literature on the Weed system are raised in this first article.

1. The chaotic nature of source-oriented records,

2. The need for self-discipline,

3. The problems of "cook-book" and memory-based approaches to medical education,

4. The need for audit,

5. The need for public accountability.

Two years later, in 1966, Weed presented his new approach to medical teaching at a conference at the Duke University School of Medicine. This paper was published in Medical Times the same year (Weed 1966) and in Resident Physician the following year (Weed 1967). The elements of the record presented in this article include a numbered problem list; plans, numbered according to the problem list; and progress notes, similarly numbered. A flow sheet is presented, although it is not identified by that name (Weed 1966 and Weed 1967).

In 1968, Weed's "Medical Records That Guide and Teach" was published in a two-part article in the New England Journal of Medicine. The first half of the article focuses on a description of the system and the values of the problem-oriented record in organizing medical records. This article adds the concept of the computerized medical record. Computerization further strengthens the argument for the need for an organized approach to medical recordkeeping. The "problems list" (sic) is mentioned in quotation marks, and it is stated that it is not static, but rather a dynamic "table of contents" for the patient's chart.

Differentiation between active and inactive problems is made. An example of the "flow sheet" is provided and labeled. It is also stated that "Many chronic difficulties are best understood and managed by relation of multiple variables over time." The complexity of living systems is further recognized in the statement: "The uncertainties inherent in complex biologic systems make titled progress notes the most crucial part of the medical record." The assets of computerization of the medical record are listed as thoroughness, retrievability, efficiency, and economy (Weed 1968, p. 599).

In the second section of this article (Weed 1968A) published in the following issue of the journal, the focus is on the value of the problem-oriented record for:

1. Placing problems in context;

2. Increasing the efficiency of the record in assisting the physician to select priorities;

3. Increasing the continuity of care (different physicians in the outpatient department who see the patient will have the same information, via the record);

4. Educating physicians;

5. Establishing a link between education, audit, and patient care;

6. Establishing a feedback mechanism for the physician's own work.

The understanding and management of any one problem require a knowledge of the presence of all of them. The need to recognize multiple, interacting factors in context is considered. Dr. Weed stated: "Physicians must assume the leadership in providing each patient with a total list of problems, irrespective of who in the medical hierarchy provided the data, and in seeing that therapeutic action reflects some perspective on the total needs of the patient" (p. 652). Much of this article deals with computerization and will be dealt with in the section on the computerized problem-oriented record.

Weed's article, "What Physicians Worry About: How To Organize Care of Multiple Problem Patients," was published in Modern Hospital (June 1968). This article describes the value of a medical record which is organized around a numbered "problem list" which serves as a dynamic table of contents for the patient's chart. The focus is the physician's need for a method of organizing information related to multiple interacting patient problems. There is a hint of Weed's

dynamic style of presentation and a powerful example of the value of this system to a specific patient's care (Weed 1968).

General Descriptions of the Problem-Oriented System

Overall Descriptions, Concepts, Philosophy

Basic Introduction to the Problem-Oriented System. The first edition of Weed's book, Medical Records, Medical Education and Patient Care, was published in 1969. This book is a clear and simply stated presentation of the problem-oriented record and of each of the components (data base, problem list, initial plan, progress notes, flow sheets, and discharge summary). It provides a clear and valuable introduction to the system.

The publication of Weed's book was followed by an expanding amount of literature with regard to the problem-oriented record. Many authors condensed the principles of the problem-oriented record and published these in their State medical society journals. Others reported their experiences in initiating or applying the principles of the problem-oriented record to different practice settings or to specialty areas and reported their experiences.

Three other basic and frequently cited books by other authors followed. Bjorn and Cross published their book on the use of the problem-oriented record in their group practice in 1970. Hurst and Walker's book, The Problem-Oriented System, was published in 1972 and expanded the concepts of the problem-oriented record to include a whole approach to medical education, audit, and patient care as implied in Weed's article in the New England Journal of Medicine, which stated that the problem-oriented record established a link between education, audit, and patient care.

This book was edited by Hurst and Walker of the Department of Medicine of Emory University School of Medicine. It consists of articles written for this book or reprints of other articles by the major proponents of the system. Sections on "Background Information;" "Practical, Educational, and Nursing Implications;" "Ambulatory Care;" "Private Practice and Continuing Education;" and "The Computer and the Problem-Oriented System" are included. The two articles in the brief section on nursing will be considered under the section on "Nursing and the Problem-Oriented Record/System" in a later section of this bibliography.

Walker, Hurst, and Woody's Applying the Problem-Oriented System (1973) states as its purpose sharing "with a wide audience the

astonishing variety of constructive and innovative changes in health care delivery that have occurred with the adoption of the problem-oriented system" (p. xv). The overall philosophy and goals of a system of health care as applied by different workers for different goals provide the content. The 10 sections, each including several articles by different authors, are:

1. Introduction.
2. Problem-Oriented Practice in Vermont. This section reports the experience of the group practice in Vermont.
3. Problem-Oriented Practice in Hampden Highlands, Maine.
4. Community Health Care Delivery: People and Techniques.
5. A Review.
6. Quality Control in Health Care Delivery.
7. Education.
8. Hospital and Specialty Practice.
9. Pathology.
10. Psychiatry and Psychosocial Aspects.

This book presents the reports of two conferences on the problem-oriented system which were held in 1972 and 1973. Consequently, the levels of sophistication and the attitudes of the different authors are very mixed. One conference was held for physicians, the other for nurses. The book includes both a sophisticated article on the congruence of problem-oriented and "nursing process" approaches and some extremely unsophisticated approaches to the role of professional nursing written by physicians. Despite its very mixed level of quality, it is probably the best single resource with regard to the basic principles, range of applications, and presentation of the assets of the problem-oriented system. Specific articles or sections will be dealt with separately in the sections which follow.

Neelon and Ellis' A Syllabus of Problem-Oriented Patient Care was published in 1974. The initial purpose for the book, as stated by the authors in the preface, was to serve as a guidebook for medical students, staff, and other health workers at Duke University. The stated goal was: "to outline a method of patient care based on a logical and intellectually ordered record that demonstrates scientific precision of thought in the daily business of patient care and discourages our contentment with half truths."

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The authors' view of the problem-oriented record is simple, direct, and honest. They see its motivating principles as "to be able to know at any particular moment, all the patient's health problems and to structure the record so that it assists in the alleviation of those problems" (p. xi). The book includes an initial statement of philosophy, which is clearly identified, and descriptions of each of the components of the problem-oriented record. The examples provided are primarily from the authors' own area of practice, which is endocrinology.

Easton's Problem-Oriented Medical Record Concepts (1974) states its purpose as the explanation in simple terms of the problem-oriented system. The author envisioned the POMR as a device for:

1. Simple and accurate accumulation of patient data;

2. Communication of that data among the various members of the health team;

3. Evaluation of health care.

A section on the nonproblem data check sheet for routine daily patient care is included.

Weed's recent book, Your Health Care and How To Manage It (1975), was written to orient the public, patients, and potential patients to the value of the problem-oriented system. It includes a description of the components of the problem-oriented record, considers the issue of giving the patient his own record, and discusses the problems of specialization as opposed to generalization. It also discusses the need for establishing rules with one's physician as to when to phone him; audit and the value of the POMR in audit; and the problems of medical education, confidentiality, basic research, and priorities in medical care.

Schultz, Cantrill, and Morgan's description of the computerized nursing unit and extensive appendices, including a computerized health questionnaire, are also included. This book assumes a certain amount of sophistication with regard to issues in medical care and education on the part of its readers. As with any other book for consumers, it should be read before assuming its suitability for any individual consumer of health care.

An article attributed in bibliographies to Dr. Weed is actually an interview with him but was not written by him personally. It is, however, a marvelous presentation of many of the current issues regarding the problem-oriented system. It offers a great deal of information, both that which has been published in more formal approaches and that which is informal. If one has never heard Dr. Weed present

his system in person, it is almost a "must" for orientation to his direct, logical, colorful, and charismatic style; for example, issues of specialization: "trouble is . . . we've never had a renal tubule walk in alone;" informing the patient of what his problems are, how they were determined, and what the plan is for each problem: "most of the patients don't know what . . . we're trying to do;" audit: "you have to define the rules." Audit, according to Weed, should be "content independent" and be geared instead to thoroughness, reliability, accuracy, and logic (Weed 1973).

Several authors have dealt with discreet components of the problem-oriented record:

1. Hurst ("How Does One Develop a Defined Data Base," 1972) and Grant ("Data Base Collection and Problem Formulation in Psychosocial Care," unpublished, n.d.) wrote about defining a data base.

2. Mazur wrote several articles regarding the problem list. Carr and Hurst (1973) used an arrow to indicate that problems have been solved.

3. Mazur ("Doctor's Plans in POMR System; Item: Patient Education," unpublished, 1972) suggested the use of specific plans for patient education.

4. Mazur ("Thoughts on the Soaping of Progress Notes," unpublished, n.d.) described the SOAP note, while others (Ellis, 1973; Hammond, 1970; Shulmon and Wood, 1971) discussed flow sheets.

Advantages, Disadvantages, and/or the Controversy Over the Problem-Oriented Medical Record System

Reviews and responses to Weed's "Medical Records, Medical Education and Patient Care" (1969) followed its publication. Many articles and heated letters to the editor occurred in response to this and other descriptions of the system. Hurst's "Ten Reasons Why Lawrence Weed Is Right" (1971) provides an enumeration of the values of the problem-oriented record:

1. It encourages sound logic.

2. It enables one to use the record as efficiently as one uses a dictionary.

3. It allows the physician to communicate his thoughts to nurses and (others) . . . who are assisting him in the immediate care

of the patient.

4. It enhances the continuing education of the physician and all who assist him in the care of patients.

5. It prepares the student and the physician for the computer world that is coming to our rescue.

6. In group practice, it will be the common bond between several doctors and a patient.

7. It will make it possible to do more accurate clinical research.

8. It will eliminate ward rounds . . . which can become patient rounds and <u>not</u> lecture rounds.

9. It encourages a more meaningful way of talking about patients.

10. Patient care is improved directly or indirectly by each of the nine reasons listed above.

Goldfinger ("Critique From a Believer," 1973) began his critique of the problem-oriented system by stating that its followers consider themselves converts to an idea whose time has come and who will brook no heresy of proposals for further evolution of the system. He raised issues of style versus substance as the focus of care, and stated that the "emphasis on compartmentalization . . . has the potential of negating synthetic thinking" (p. 607). He also stated that the data base cannot be a discreet section of the chart, that in fact, every progress note yields data that constitute a base for further action. He objected to the inconsistent quality of entries by a "variety of allied health personnel" which add bulk without meaning. The issue of "intuitive skill," the quantum leap from bits of information to the meaning of information, was raised. Its compatibility with computerized approaches was questioned.

Finally, Goldfinger (1973) questioned the claims that the problem-oriented record will greatly facilitate audit. He stated that gaps in all records exist. Most audits are designed to measure style ("Is there a problem list?" "Are progress notes problem-oriented?") rather than content. His conclusion reiterates his support of the problem-oriented record and the contributions that it has made, but also states his concern that it may not be the panacea that its believers consider it to be.

The same issue of this journal carried Hurst, Walker, and Hall's rebuttal of the Goldfinger article, "More Reasons Why Weed Is Right." They compared the problem-oriented record with a car--a tool to achieve a stated purpose, even though not everybody drives it in the same way. They responded to Goldfinger's statement that there should be more emphasis on substance rather than style by stating that the POR enables one to determine instantly the level of understanding held by the writer

of the note.

These authors responded to Goldfinger's objection to sorting out a discreet data base by stating that an initial data base must be defined and carried out every time. They responded to the issue of the greater amount of time needed to identify pertinent data by stating that there are studies to determine the difference in speed and accuracy of information retrieval from traditional versus problem-oriented records. They answered the issue of audit by differentiating audit for the presence of all the elements of the record and audit according to standards for the management of specific diseases. They concluded by stating that if the POR is not used properly, it will be impossible to correct deficiencies in medical logic and patient care. A lively group of letters in response to Goldfinger, Hurst, Walker, and Hall appeared in a later issue of the same journal.

Buchan (1973) was "bemused" by the consideration that changing terminology is going to advance medical education and medical care. Similarities between the concepts underlying old and new words were noted: problems and complaints, subjective and symptoms, objective and signs, and assessment and differential diagnosis. He feared that a cult of the record could well see the patient lost in the process.

Issenberg and Mikell (1973), junior medical students from Emory University, were taught under the problem-oriented system and supported it. They stated that the identification of problems is only the beginning of a process of synthesis. The POR not only encourages this synthesis but also demands it.

Goldfinger ("The Problem of the Problem-Oriented Record," 1973) responded to all of this by stating that while all the arguments presented are compelling, he remained pessimistic. The motivation and discipline required for the proper use of the POR may be lacking in many of its future users. Skilled observation, intellectual honesty, and healthy self-criticism may be more important in medical education than the single goal of recordkeeping.

In another journal (Annals of Internal Medicine), Feinstein (1973) differentiated between the values of the problem-oriented record itself (the freedom to identify problems as they exist without using medical diagnostic terms, the inclusion of a format for patient education as an intervention, and the method for organizing previously random records) from the apparent advantages which arise not from the system, but from the enthusiasm of its users. He stated that "illusory advantages" result from the vigorous supervision of the system. He felt that continuity of care, quality health care, continuing audit of patient care, and interdisciplinary coordination are not essential outcomes of the use of the problem-oriented system.

Feinstein argued that the problem list fragments the patient no less

than specialty areas do, and raised the question of relevance of information in an unedited data base. He believed that the emphasis on recordkeeping, rather than on strategies of patient care, is a negative factor of the problem-oriented record. He objected to Weed's consideration of the MMPI in an automated data base as a means for the patient to obtain "immediate, sympathetic understanding of the forces with which he or she is struggling." Other issues raised as disadvantages of the system have included: "The reader may wonder whether the problem-oriented records work as well as it is claimed and whether maintaining them does take too much time" ("The Medical Record: Cover Up or Teaching Tool," 1969).

Although Carson (1973) agreed with the necessity of the Weed system to accomplish needed changes in medical care, he stated that the ease of computerization and the value resulting from it are not necessarily synonymous. He also suggested that the ability to comply with the system, rather than the quality of medical care, is audited, and he was concerned about shifting the focus of providers from fundamental problems to the record. Hawkins (1973) voiced his concern that the problem list can offer a false sense of security, but stated that the problem-oriented record is better than any disease-oriented medical record.

The National League for Nursing (1974) listed both advantages and disadvantages of the system in their book, The Problem-Oriented System --A Multi-Disciplinary Approach. The disadvantages include:

1. The mechanics of recording information requires too much time initially.

2. It quickly uncovers an individual's deficiency in information and assessment.

3. It may be threatening to allied health personnel who enter the main arena of recording their contribution to patient care.

4. It requires the discipline of analytical thought (p. 10).

The advantages of the POMR listed in this monograph include:

1. It establishes the concept of patient care, not just nursing care or medical care.

2. It allows all participants in patient care to contribute meaningfully to the record.

3. It provides documentation of comprehensive care (or lack of it) through the continuity of the data recorded.

4. All data become problem-oriented and, therefore, immediately relevant.

5. It prevents the duplication of data.

6. It prevents oversight of essential information that needs attention.

7. It permits easy audit for efficiency, effectiveness, and performance.

8. It allows ready access to specific problems for audit and teaching.

9. It identifies individual and staff needs which provide feedback for continuing education programs.

Additional assets of the system were presented in Lancet ("Problem-Oriented Medical Records," 1972). We have no rational procedure for classifying the data of human illness. Weed avoids this by dealing with problems and by identifying these problems on a level consistent with understanding. Clarity and honesty in defining problems should apply to behavioral and social problems no less than to physical problems.

Cross (1971) identified the POMR's advantages of honesty of diagnosis, the opportunity to explain deviations from the usual management of problems to the patient, and the provision of a more adult-adult relationship with patients. Twin (1974, pp. 22-28) stated that the system is so logical, so basic, so simple, and so adaptable to the computer that one wonders why none of us thought of it before.

Numerous letters and articles support the problem-oriented record. Most of these points are covered in Hurst and others' two statements, "Ten Reasons," and "More Reasons Why Lawrence Weed Is Right." In addition, most of the literature regarding the concepts and philosophy of the problem-oriented record includes statements of the value of the system, especially as it applies to a specific function or setting.

Pfifferling's discussion (1974) includes reasons for physicians' resistance to the POMR and humanistic strategies to encourage their acceptance of it. The new record should be introduced at a time when the staff feels that record reorganization is necessary. Strategies to achieve acceptance of the new system and to minimize resistance would include:

1. Disseminate information about the POMR;

2. Provide a forum for discussion;

3. Invite all staff members to participate in the decisionmaking;

4. Focus on the similarities between the new system and the traditional system.

The factors which may delay conversion are listed. Three major factors in physician resistance are:

1. The threat of perceived infringement on the physician's domain,
2. The threat of substituting problem titles for diagnoses,
3. The fact that physicians are not trained to state explicitly the method they use to arrive at diagnoses.

Initiating the Problem-Oriented Record and/or System

Methods for Initiating the System

Bjorn and Cross (1970) described the initiation and use of the problem-oriented system in their group practice. This book is a frequently cited resource for physicians. Hurst's "How To Implement the Weed System . . ." (Hurst and Walker 1972) provides a description of the components of the problem-oriented record and rules for their use. He discussed the obstacles to acceptance of the record, which he identified as being related to:

1. Acceptance of innovation,
2. The mechanics of the system,
3. The quality of the problem list.

Wakefield and Yarnall's Implementing the Problem-Oriented Medical Record (1973) is a report of a conference that was held in Seattle during 1972. It includes the rationale for initiating the POMR, a description of the system, and future implications (computerization), in addition to the methodology for implementing the system. The section on the methodology for implementing the system includes consideration of (1) staff education, (2) design, and (3) audit. The authors stated that the flow sheet is valuable whenever the interaction of variables is critical. They also stated that the record is a means, not an end, to improved communication between health care providers to assure high-quality comprehensive health care. The unique characteristic of the POMR is its explicitness.

A survey of medical record librarians in 18 hospitals using the POMR indicated that 4 factors were particularly important for success in implementing the new system (Wogan 1971):

1. Involvement of the medical record librarian;
2. Planning for followup and audit of results and for workable forms;

3. Education-orientation of those who will contribute to the system;

4. Followup identification of areas of strengths and weaknesses, and planning for methods to correct deficiencies.

Esley (1973), a medical record librarian, presented a specific method for initiating the system, including a discussion of its legal aspects, and provided an extensive appendix of forms.

Reports of Initiating the Problem-Oriented Record and/or System

Several articles in Walker, Hurst, and Woody's Applying the Problem-Oriented System (1973) deal with the initiation of the system. Tufo and others (1973) described setting up the problem-oriented system in a group practice in Vermont. They considered the patient to be a major, untapped resource in the health field. They described their use of patients to audit their own subjective data and their belief that patients have a right to their own medical information. This revolutionary and valuable concept is applied in their practice.

McCracken (1973) described her process in setting up the problem-oriented record in a family practice clinic. She included forms, patient orientation, and a medical history questionnaire in her article. Mazur (1974) described the process of establishing the problem-oriented system in a State psychiatric hospital. He included a brief discussion of the strategies used and methods of informing the staff and the public in initiating the use of the system.

Asp and Brashear (1973) discussed the initiation of the problem-oriented system in a private hospital. The time required to initiate the system in a private practice was documented by Froom (1973). Three hundred records were converted to the problem-oriented method at the time of the patients' scheduled visits. The conversion took about 5 minutes per record and was accomplished during broken appointments or during the time that the physician normally spent waiting for the patient to dress or undress.

Applications of the Problem-Oriented Record

Walker, Hurst, and Woody's Applying the Problem-Oriented System (1973), reviewed in the general introductions to the system, includes applications of the system for various purposes, in various settings, and by various health professionals.

Applications of the Problem-Oriented Record and/or System for Specific Functions

The logical organization of the problem-oriented record provides a basis for maintaining feedback to the health care providers using the system. Two uses of the POS, audit and education, are based in the single concept of providing a feedback loop to the providers of care. Algorithms provide a structured set of guidelines for purposes of guiding the decisionmaking process in care, and facilitate audit of the performance of the person providing that care.

Audit.--Donabedian's (1966) classic article on evaluating the quality of medical care is not directly related to the problem-oriented system, but it does consider basic principles of evaluation. He differentiated between three approaches to evaluation:

1. The outcome of care;

2. The process of care;

3. The process, settings, and instrumentalities of care.

Donabedian identified the confounding issue of the difference between the recording of care and the actual care itself, and stated that these two distinct aspects can be separated when another source of information, such as the direct observation of the care itself, can be provided. Two uses of the POS, audit and education, are based on the single concept of feedback. As a result, there is considerable overlapping of these two concepts in the literature, and consideration of any given article under either topic is often purely arbitrary.

Weed ("Questions Often Asked About the Problem-Oriented Record--Does It Guarantee Quality?," 1972) described the problem-oriented record and its components, then discussed the four characteristics which he believed should be audited and which can be observed when the problem-oriented record is used. These are: (1) thoroughness, (2) reliability, (3) analytic sense, and (4) efficiency. This article is directed to the audit of physicians and medical students, but the principles listed above need not be limited to audit of medical performance.

Weed's ("Quality Control and the Medical Record," 1971) basic philosophy, concepts, and principles regarding audit are presented. Four premises of the problem-oriented audit of the physician are given:

1. All the data after the data base must be associated with a specific problem.

2. All the data on any given problem must be easily retrieved in sequence and with complete currency.

3. Conclusions will be much more difficult when there are concomitant problems in the same patient and must then be determined individually.

4. Procedures 2 and 3 can be followed with computerized data only (pp. 257-58).

Weed stated: "a physician should be audited to determine whether he is a good guidance system, responding intelligently to feedback information in a very well defined, though necessarily incomplete set of measurements. The shape of his path through the difficult biological situation is generated as he goes and is not known until the input stops" (p. 104). In another article ("On Being Responsible and Setting Priorities," 1973) Weed differentiated between the audit of individual performance and the audit of the system. He presented criteria for audit of the data base and discussed factors related to audit of the problem list, plans, and progress notes.

Weed also stated that the mindless application of criteria may lead to disregard of the patient's uniqueness and identified that specific components must be audited in the context of the total patient's problems. Hurst, in his article, "The Problem-Oriented Record and the Measurement of Excellence" (1971), stated that rules provide the framework within which excellence can be judged and achieved. He failed to differentiate between medical care and the medical record.

Burger, Bjorn, and Cross (1973) stated that the basic requirements for audit, according to Weed, are:

1. The system must be described;

2. The users of the system must be audited for performance within the rules of the system;

3. The system itself must be audited and updated through analysis of the data it generates.

Three approaches to audit are described. Audit can be based on:

1. Arbitrary criteria for a single problem;

2. Outcome analysis;

3. Behavioral analysis of thoroughness, reliability, analytic sense, and efficiency.

The last is the most appropriate, and its use at the PROMIS clinic in Maine is described.

Spitzer (1973) critiqued an article by Lipp. Although Spitzer was in favor of the problem-oriented system, he disagreed with Lipp's focus on the use of the POMR for process audit. His major objection was the inability to discriminate between writing a good problem-oriented record and providing good care. In addition, there is the threat of treating the record, rather than the patient. Once systems

are installed, the tendency is to "let them grind" whether or not they solve the problems for which they were designed.

Lipp's response ("Author's Reply," 1973) to Spitzer's criticism identified the potential for differences in perception by (1) the patient, (2) the therapist, (3) the record in the chart, and (4) a hypothetical objective observer. Any audit system based on process will have this difficulty; it is not limited to the POMR. Goldfinger's (1972) letter responded to an article by Feessel and VanBrunt ("Assessing Quality Care From the Medical Record," 1972). It suggested that Weed's "Patient Education" section of the POMR would have considerable bearing on audit design, especially in conditions in which the physician has a limited impact on the outcome.

Education and continuing education of physicians.--It is not the intent of this review to evaluate literature with regard to medical education. However, some of the concepts used in this literature are also applicable to clinical nursing education. One of the main assets of the problem-oriented record is the accessibility of the student's logic, presented in the "assessment" component of the progress note. This early article by Weed ("A New Approach to Medical Teaching," 1967) presents several basic premises:

1. The medical record can be used as the basis for the quality of patient care;

2. The medical record can be the basis and primary focus of clinical teaching;

3. Basic science should teach the student how to:

   Collect data,
   Work on one thing at a time,
   Write up the problem,
   Conduct a good audit,
   Proceed to the next problem.

A later article by Weed ("The Implications of the Problem-Oriented System for Medical Education," 1972) condemned memory-based education. Weed identified and attacked old premises in medical education and presented his new premises in his article in the New England Journal of Medicine ("CPC's as Educational Instruments," 1971). The old premise of the importance of memory of medical information should be replaced with the capacity to define problems and to find and use knowledge effectively. The old premise of the teacher's role of communicating information is contrasted with the newer role of the teacher as disciplinarian and auditor. The old value on resources of academic settings for experience and equipment for basic research is contrasted with the new value on the student's own resources--his capacity to learn, think, and solve real problems on his own. Computerization of information which was previously

stored in human memory permits a curriculum which will facilitate the student's development in other areas.

Development of algorithms and supervision of physicians' assistant.--Several authors have dealt with the development or use of algorithms which they used to train physicians' assistants. There is little or no differentiation between the role of a physicians' assistant and the nurse clinician in this literature, and the titles of these different roles are often confused. However, all of the literature (except for Mazur's approach to algorithms) describes, in essence, physicians' assistants' roles, or perhaps at best, the dependent functions of a technical nurse.

Burger, Cross, and Bjorn (1973) from the Hampden Highlands, Maine, group, outlined a format for incorporating episodes of acute self-limited illness into the framework of the POMR. An algorithm for sore throat is presented. They stated their philosophy that: "We believe that non-physicians can provide patient care without direct physician supervision only when clear, objective criteria can be defined to guide their actions."

Mazur's memorandum ("Weed Without Tears . . .," 1972) presented three algorithms for:

1. Ranking active problems,

2. Ranking inactive problems,

3. Consolidating problems.

Mazur's approach to algorithms is congruent with a professional decisionmaking process and leaves room for the selection of the relevant criteria to the patient and to the professional.

Applications of the Problem-Oriented Record and/or System to Specific Settings and Services

Private practice.--A large amount of literature that deals with the application of the POMR to private practice will not be discussed.

Ambulatory care.--The literature regarding applications of the problem-oriented record and system to ambulatory care reiterates its assets in these settings.

Rehabilitation.--The literature that deals with applications of the problem-oriented record and system to rehabilitation offers several new concepts.

Dinsdale s article (1970) mentions that the previous emphasis on goal setting has shifted to the definition of specific problems. Goals, he stated, emerge for interacting groups of problems. Milhous (1972) stated that the team conference is a powerful force for uniting patients and staff. In Applying the Problem-Oriented System, he noted that patient education was improved; team members united around the patient, rather than according to their own professional identities; and student teaching was improved. Patients were given a copy of their own problem list and the initial plans for each problem.

Psychiatry and the psychosocial aspects of care.--There is a considerable amount of literature regarding the use of the problem-oriented system in psychiatric settings or for the psychosocial components of patient care. The general tone of this literature considers the problem-oriented system to be no less valuable in the psychosocial aspects of care than in any other form of care. Grant's work deals primarily with developing a data base for the psychosocial component of patient care, regardless of the setting.

Concerns have been raised by those who are cautious in their acceptance of the use of this system for psychosocial care. Heavy medication or certain behavior therapies might mask individual client problems to the detriment of the patient's total well-being. A problem-oriented audit could produce favorable results in such instances. Another concern was raised by those who object to the use of a standard format such as the Minnesota Multiphasic Personality Inventory as a means of obtaining a psychosocial data base.

Finally, psychiatric diagnoses as problems are not functional. Traditional psychiatric diagnostic categories offer little information regarding the unique problems, experiences, history, and method of treatment for clients. The argument for a greater degree of specificity in identifying problems is made by Abrams, Neville, and Becker (1973). Their article deals with the psychosocial components of care in a rehabilitation setting. The authors devised guidelines for use with psychosocial problems. The problem statement must be as specific and objective as possible, and include the way in which the problem interferes with this patient's or another's rehabilitation. The main focus of this article is toward increasing the specificity of the statement of problems toward more humanistic care of patients.

Gilandas (1972) stated that progress notes recorded by team members representing a variety of orientations are the most important element in the problem-oriented approach. These, he said, serve as corrective feedback. He also stated that the physician must use his skills to integrate the recorded information and that he must be aware of problem interaction. In a later article (1973), Gilandas provided a sample problem list and treatment plan. He mentioned the need to recognize the patient's assets and strengths, as well as his problems. He believed that although the problem-oriented record is not the solu-

tion to all problems, it could take the mystery out of psychiatry.

Although primarily related to utilization review, another article by Gilandas (1974) considers the application of the problem-oriented record to psychiatry. Recognition of the wide variety of techniques and theories used by professionals in the psychosocial area is countered with a statement from Truax that the behaviors of effective therapists are strikingly similar despite their different theoretical stances.

Grant ("The Problem-Oriented System in Psychiatry," 1973) provided a brief background of the use of the problem-oriented record in psychiatric settings (University of Oregon; Osawatomie State Hospital, Kansas; and McLean Hospital, Boston, Massachusetts). He described the components of comprehensive care as being (1) social, (2) medical (physical), and (3) psychological, as well as including the interaction of these three factors. He believed that the problem-oriented record seems to rely strongly on a medical, disease-oriented model. He raised the issue of abstract diagnostic labels in psychiatry, which are not functional. He stated that people who are not medically trained "tend to resist . . . structure such as the POR" which "tends to discourage creativity and idiosyncratic behavior" (p. 446).

In another article, also in Walker, Hurst, and Woody ("Toward a Psychosocial Data Base"), Grant argued for the inclusion of a psychosocial component in any comprehensive data base. The general areas for inclusion in such a data base are listed. Grant's ("Enthusiasm No Substitute for Hard Work," 1973) description of the application of the problem-oriented record to psychiatry and to audit included a statement of the need for critics who work with the system and who can see both its advantages and its needs. In an unpublished paper prepared for the Association for the Advancement of Behavior Therapy ("Comprehensive Health Care Records, Behavior Based Therapies, and the Problem-Oriented Record," 1973), Grant stated that the most useful way to define the broad range of psychosocial problems is at a theory-free, functional, problem-management level.

Two nurses, Hawley and Smith, worked with Grant (Hawley, Smith, and Grant, 1973) to initiate an audit system for psychosocial care at the University of Vermont. The article includes the following criteria for audit:

1. Completeness of the data base,

2. Inclusion of problem areas indicated on the data base on the problem list,

3. Level of specificity of the problem definition.

A summary of the results of the audit showed deficiencies in dietary, cultural, and legal histories (50 percent of the records had no data);

economic, religious, and cultural histories (40 percent of the records had no data); and interpersonal areas (35 percent of the records had no data).

Hayes-Roth, Longabaugh, and Ryback (1972) dealt primarily with the value of the problem-oriented record in supporting the transition from manual to computerized record systems. They discussed the value of the problem-oriented record's organization as a method for facilitating studies within and between different hospitals; the definition of precise, valid, and reliable diagnostic categories; and their forms of treatment. Their article, published the following year (Hayes-Roth, Longabaugh, and Ryback 1973), includes principles which have value beyond the specific application to a psychiatric setting. It includes the following topics:

- Systems analysis as applied to the mental hospital.
- The crisis orientation of the mental hospital.
- The functions and decisions within such a hospital.
- The compatability of the problem-oriented record with the information needs of the hospital.
- How a hospital information system learns and utilization review.

Mazur's unpublished memorandum, "Weed Without Tears or Twelve Easy Steps to Make a Complete Problem List," (1972) stated that his approach is rooted in A. Meyer's holistic approach to human life experiences. As a result of this approach, Dr. Mazur has recommended a list of assets to follow the problem list, a major innovation in the problem-oriented system. He recommended the problem-oriented record to his staff from the viewpoint that it is a tool for improving the care of patients and must be adopted to fit patient needs, rather than trying to squeeze the patient into its format. He presented a method (lines connecting problems) for consideration of the relationship between problems. The notion of potential problems is balanced with that of the potential for the resolution of problems.

Mazur described an algorithm for ranking active problems which includes the degree of threat to the patient's life, the patient's recognition of the problem, and its potential for positive response to treatment. An algorithm for ranking inactive problems is based on the potential for change (better or worse), degree of threat presented by the problem, its potential for response to treatment, and the likelihood of its reactivation.

Mazur has stated (personal communication) that he believes that his major contribution to the problem-oriented system is his concept

of a list of assets. This concept is presented in his unpublished memorandum ("Problem-Oriented Records . . .," 1972). The list of assets may be organized according to the availability, intensity, or location of the resource. In "Coffee Break Questions" (1972), Mazur suggested that Dr. Weed's book had started a revolution and initiated a change for the better. "Most of us are for it. However, we must not regard this book as a holy writ containing dogmas from which no departure is permissable (sic) . . . The POMR system is a tool devised for patients with somatic illness. It is our job to modify this tool to fit our needs in treating psychiatric patients." Once again, he has stated that we must shape the form of the POMR system to fit the patient, rather than try to squeeze the patient into a preconceived form.

In "The Problem-Oriented System in Psychiatry" (1973), Mazur presented the reasons for the problem-oriented system and its basic workings. He found that the adaptation of the system to psychiatry showed the need for inclusion of a list of assets. He felt that a negative attitude is fostered by the focus on problems by both patient and therapist in the traditional problem-oriented approach. The importance of strengthening the healthy part of the person and mobilizing his resources is part of the "healing" process. The construction of a list of assets provides the solution to this problem. "The vital balance approach to the POMR system, integrating the 'catabolic' vector of the pathological factors with the 'anabolic' vector of the health-promoting forces should make the Weed system acceptable to most psychiatrists irrespective of the 'school of thought to which they may ascribe'" (p. 6).

Novello's article (1973) deals with the applications of the problem-oriented system to psychiatry, the report of the institution of the system in a 28-bed adult psychiatric unit, and the specific adaptations of the system. Treatment goals and treatment plans are included in the problem list. Progress notes include the staff's response to the patients. In addition to the flow sheet, a progress chart includes progress ratings by all staff and sometimes by the patient.

Ryback and Gardner (1973) identified and countered three issues in psychodynamic problem formulation:

1. Problem formulation in this area is so complex that crystallization into a phrase may be meaningless. The answer to this issue is the concept that the state-of-the-art may be imprecise, but this does not argue against the method.

2. The philosophy of viewing the patient as a list of problems appears to ignore the patient's strengths and adaptive solutions. This is answered by the notion that the patient seeks care precisely because he is symptomatic.

3. The problem-oriented format ignores the patient's basic individuality and wholeness. This objection is countered with

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the author's observation that the more complete the problem list, the more closely it approximates the patient's individuality and that each problem is assessed and treated in the context of the other problems.

Sedhev's article (1974) presents a logical, realistic, humanistic approach to the use of the problem-oriented record in child psychiatry. Psychiatric problems inevitably cut across other major areas of human functioning or need. The author proposed that problems be categorized into related clusters under broad categories to deal with this. It is suggested that the degree of abstraction in problem formulation be both specific yet allow flexibility for staff members. Harvey (1974) considered psychiatric diagnostic "labels" to be nonfunctional in the problem-oriented system and argued for objective, observable behaviors as problem statements.

The Togas Veterans Administration Center report on the problem-oriented record (Pfifferling 1974) describes the problem-oriented record and its application to the problems encountered in a psychiatric setting. In psychiatric settings, data are more difficult to sort into subjective and objective components. Therefore, a DAP (Data, Assessment, Plan) is used rather than a SOAP format for the progress note. This report includes Gilandas' "Problem Classification Guide," which provides a working list of problems encountered in patients with psychosocial problems. Finally, Rothstein's letter (1973) argued for differentiation of alcoholic problems according to the type and length of treatment required. He offered the example of the treatment of an acute episode of intoxication, which differs greatly from that for chronic alcoholism or Korsakoff's disease.

Acute care and coronary care.--Applications of the problem-oriented record and/or system in acute care and coronary care settings consist primarily of Silverman's two articles. One of Silverman's two articles is in The Problem-Oriented System (1972); the other is in Applying the Problem-Oriented System (1973). Both describe the perceptions of a physician of the effect of the use of the problem-oriented record on "his" nurses in a coronary care setting. "The physician is now able to evaluate the performance of the nurse and identify areas that need improvement" (Applying the Problem-Oriented System, p. 384). Gardner (1972) stated that it is "of utmost importance that problems be listed together as soon as an association between them is established. The error of failing to recognize the relationship between problems is just as serious as failing to recognize a problem at all" (p. 658).

Ob-Gyn, pediatrics, school health, and college health.--Applications of the problem-oriented record and/or system to Ob-Gyn, pediatrics, school health, and college health programs are few. Narang (1973) conducted a study in a pediatric setting. A far greater number of problems were identified by using the problem-oriented system, compared with the number of diagnoses established by using the traditional system. The

problems identified were primarily in the areas of malnutrition and anemia, and it is impossible to identify whether or not the identification of these problems was due to the problem-oriented system or to some other factor (such as the emphasis of a professor).

Other medical specialty areas.--Applications of the problem-oriented record to other medical specialty areas have little relevance for nursing. Applications of the problem-oriented record to long-term institutional care (Crawford 1973), cancer care (O'Connor 1974), pathology, and other medical specialty areas are included within the literature.

Dentistry, pharmacology, nutrition, and other nonmedical areas.--Applications of the problem-oriented record in dentistry, pharmacology, nutrition, and other nonmedical areas are also included within the literature.

Studies and Surveys Regarding the Problem-Oriented Medical Record

Aranda's study (1974) compared source-oriented and problem-oriented records in a community military hospital with regard to the number of problems identified, the availability of objective data, and the adequacy of followup. More problems were identified in the problem-oriented charts (3.8 active problems per patient) than in the source-oriented charts (3.2 active problems per patient).

Adequate data to support the diagnosis were found in a greater percent of the problem-oriented charts (for 72 percent of the problems) than in the source-oriented charts (for 69 percent of the problems). Followup was judged to be adequate for 85 percent of the problems in the problem-oriented group and for 77 percent of the problems in the source-oriented group of records. These differences were not significant at the 0.001 level. The rationale for choosing this extreme level of significance was not given.

Additional findings showed misfiling of reports in very few (1.3 percent) of the problem-oriented records and in a high percentage (43.0 percent) of the source-oriented records. Unnecessary tests were ordered in 33 percent of the nonproblem-oriented cases. This was probably due to the inability to determine whether the tests had been ordered or to the loss of test results. The time required to convert and to review these records was also reported.

The author concluded that: "Our results seem to demonstrate that in a community military hospital, adequate objective data and followup does not depend on record style and organization but on the quality of the observations made and the interest and time devoted by the primary

physician in the interpretation and recording of his clinical observations" (p. 551) However, the problem-oriented record did facilitate the functions of the records committee. It also decreased filing time and improved the filing system of the record room.

Asp and Brashear's report (1973) of the initiation of the problem-oriented system in a community hospital includes the results of three investigations.

1. An audit of nonproblem-oriented records showed them to be largely unacceptable.

2. An audit of problem-oriented records showed both a higher initial quality of the record and an improvement over time.

3. A "subjective audit" and physicians' and nurses' impressions of the value of the POMR was conducted by means of a questionnaire which was distributed on two occasions, 4 months apart. The results showed those physicians who responded to the questionnaire to be generally more favorable to the POMR than the nurses who responded (36 of 40 for physicians, 32 of 40 for nurses).

The favorability of nurses' responses decreased during the 4-month interval with regard to the usefulness of the record and its value in improving communication between all involved in the care of the patient. It increased, however, from 38 percent responding "yes" to the question "Do you feel your patient care has improved?" to 50 percent. This article is notable for the practical methods used to introduce the system and for the questions asked with regard to the effects of the problem-oriented system. The criteria for chart review for both traditional and problem-oriented records are included. The reporting of both methods and findings lacks consistency, but makes no pretense to sophistication of research methods.

Campbell and Cooper (1973) conducted a survey of physicians in the Department of Urology at Kaiser Foundation Hospital in Los Angeles. The findings indicated that the physicians:

1. Considered the POR to be helpful;

2. Thought that discharge summaries were easier to write;

3. Felt that the POR yielded better data.

Dixon (1973) reported the results of an investigation of the number of suggestions made by residents in their audit of interns' problem-oriented records and the interns' evaluations of the usefulness of the system. The most favorable responses were related to gaining new ideas

for plans from the auditor. The least favorable were replies to the auditor's suggestions of inaccurate information in the data base.

Fletcher's (1974) study was designed to compare problem-oriented and nonproblem-oriented records with respect to auditability. No significant difference was found between the two types of records with regard to dependent variables of speed, accuracy, and number of errors detected on audit. In this tightly designed study, four complex medical records were converted to problem-oriented and nonproblem-oriented formats and presented to 36 house staff members. An example of the initial assessment and plans for both formats is included within the body of the article. Both formats are typed and legible. The author's intention of controlling variables not directly attributable to the POR (such as legibility) is clearly stated.

Neelon's critique (1974) of Fletcher's study was directed primarily at the unreal form of the experimental model in which the source-oriented record was both well organized and legible. This, he stated, does not reflect the reality of clinical practice. However, he did state that Fletcher clearly demonstrated that when each format contained equal amounts of information, there was no difference in the ability of trained observers to read and comprehend this information, regardless of format. Content, not form, determines whether the record can be audited. Neelon argued that the POR by its very structure leads to discipline in collecting and recording information, whereas the source-oriented record does not.

Froom (1973) converted 300 patient records to the problem-oriented system over a 3-month period. A mean of 6.4 minutes and a median of 5 minutes were required to convert each chart at the time of the patient's visit. The author projects that an entire practice could be converted to the problem-oriented system in this manner over a period of 2 years.

Gledhill's discussion (1973) of the addition to the record of a problem-oriented medical synopsis is followed by a report of the number of problems identified before the use of this synopsis and afterward. Averages of 3.2 problems per patient were identified in the 907 charts reviewed for the "before" measure. An average of 4.5 problems per patient (N=200) were identified for the charts of patients receiving care after the introduction of the synopsis. This difference was found to be statistically significant, using log transformations of the data. An additional investigation reported eight physicians' responses to a questionnaire:

Advantages		Disadvantages	
Helps with case workup---	8	Extra paperwork----------	3
Helps doctors communicate	8	Timewasting-------------	1
Research potential-------	8	Inflexible format--------	1
Helps educate doctors----	6	Leads to unjust criticism	1
Helps with patient care--	5	Redundancy of effort-----	0

The physicians' responses to Gledhill's synopsis indicate that the advantages outweigh its disadvantages.

Iverson and Yarnall (1972) surveyed general practitioners in the State of Washington. They found that only 23 percent of these physicians were familiar with the POMR and only 4 percent used it. About 34 percent responded to the survey letter (1,203 letters, 407 responses), but a sampling of 100 nonrespondents produced no significantly different results.

Margolis, Sheehan, and Stickley (1973) reported their investigation in Applying the Problem-Oriented System. The study was intended to "measure the objectivity, validity, and reliability" of a graded POR as an instrument that would evaluate clinical performance. At the same time, an attempt was made to measure the difference in student performance between those students who had a teaching resident assigned to them and those who did not. The "validity" of the graded problem-oriented record (GPOR) was established by having seven faculty members grade a single workup. The checklist for grading the modified problem-oriented record is presented in the article and consists of very basic items regarding content (presenting symptom, age, sex, numbering of problems) along with one more sophisticated item, "the problem is currently defined."

A comparison of the midexperience scores for students with an assigned teaching resident and without one showed a significantly higher score for students with a teaching resident assigned. However, there was no significant difference for this group of students at the beginning, middle, or end of their experience, so whether these results can be attributed to the presence of the teaching resident is doubtful. These students were the one group that had had the prior experience of grading a POR prior to the initiation of the study. It was concluded that the graded POR could objectively measure facility at data collection and recording, as well as problem solving, and that students were taught these skills by grading a medical workup themselves.

Narang and others (1973) conducted a preliminary study to identify the number of diagnoses (or problems) listed before the introduction of a modified problem-oriented system and afterward. The results showed a most impressive difference in the number of problems (primarily related to malnutrition, anemia, etc.) identified: 140 cases were reviewed for each period; 192 face sheet diagnoses were found and 454 missed

during the first period; 490 face sheet diagnoses were found and 12 missed during the second period. The authors stated that there were no differences in the number of house staff or in their workloads during the two periods. They did not state whether or not there was any increased teaching emphasis or reinforcement with regard to identification of the problem-related to malnutrition during the second period.

Newble (1974), using a sample of 10 physicians, studied their acceptance of problem-oriented medical records. He found a generally favorable reaction to the parameters chosen (practicality, importance, benefit to me, benefit to the patient, technicality), and the only clearly unfavorable reaction was to a final item--the amount of time required. Scott and Sniderman's study (1973) of clinical competence, rather than of the problem-oriented record, used a checklist based on the problem-oriented format to evaluate the clinical competence of house staff members.

Switz (1973) studied the value of the problem-oriented record in facilitating the identification, treatment, and resolution of patient problems. The length of time required to identify, treat, and resolve the problem of anemia before the introduction of the problem-oriented medical record and afterward was used as the criterion. The amount of information relevant to anemia was also audited. No significant difference was found in either the amount of time required for any of these activities or in the amount of information relevant to the problem before the introduction of the POMR and afterward.

Wogan's report (1971) of a survey of medical record librarians in 18 hospitals using the POMR provided little information about the methodology she used. The results were reported in narrative form only. They indicated that:

1. Original interest for implementing the POMR usually came from a physician.

2. Involvement of the medical records librarians in initial planning varied greatly.

3. Anticipated difficulties in implementing the system included physician resistance, apathy, use of paramedical personnel for history taking, and lack of followthrough. These problems were less difficult than anticipated.

4. Coding of social and economic problems constituted a difficulty.

5. Abstracting records was easier.

6. Frequency of audit procedures varied, but most often was about once a week.

7. A great deal of time was required for teaching and followup.

The respondents stressed that involvement of medical record librarians, anticipation of problem areas, training all those who will use the system, and followup on areas of difficulty are important to success in implementing the POMR.

Modifications of the Problem-Oriented Record

Many modifications of the problem-oriented record have been reported in the literature. Mazur ("The Vital Balance Approach to the Problem-Oriented Practice," 1974) introduced a list of assets and resources on the psychiatric record. St. John and Soulary (1973) initiated the use of goals, rather than problems, as the organizing elements for the record. May (Brentwood, Veterans Administration Hospital, 1976) also developed and maintained a newsletter designed to disseminate information regarding both the use and the innovations in use of the POMR ("Developments in Problem-Oriented Medical Records," January 1974).

Manuals and Teaching Guides for the Use of the Problem-Oriented Record and/or System

Many manuals have been developed for the use of the POMR in specific settings. They consist primarily of condensations of POMR principles and forms developed for specific settings. The Systemedics Corporation prints both the PROMIS II adult medical history questionnaire and other forms for use in the problem-oriented medical practice.

C. NURSING AND THE PROBLEM-ORIENTED RECORD

Introduction

The problem-oriented record and the problem-oriented system have been adopted by nurses for a variety of purposes and in a variety of settings. The problem-oriented system, closely akin to the nursing process system, encourages interdisciplinary collaboration which is, in theory, patient centered. It is important, however, to differentiate between the types of patient problems which nurses manage and the types of patient problems which physicians manage.

Concepts, Philosophy, and Descriptions of the Use of the Problem-Oriented Record and/or System by Nurses

Books and Monographs

The National League for Nursing (1974) published a book, The Problem-Oriented System--A Multidisciplinary Approach, in 1974. The initial pages of this book provide a clear, concise, graphic description of the problem-oriented record: its uses, content, advantages, and disadvantages. Several exercises designed for groups follow the series of articles which constitute the bulk of the book. Lambert's article in this book is specifically related to the general principles of the problem-oriented system as it relates to nursing and is included separately below.

Woolley, Warnick, Kane, and Dyer's concise book (1974) is an introduction to the problem-oriented system designed for nurses. It includes a general description of the system and chapters on audit, education, implementation, and experience with the problem-oriented system. Excellent graphic presentations are included within the text. The section on problem identification is presented from a primarily medical point of view. It also includes a series of exercises, which although based on medical diagnoses, are excellent for understanding the principles and use of the POR. A "nursing" data base follows. This includes a review of systems and physical examination. Berni and Ready's book (1974) is directed to allied health personnel.

Walter, Pardee, and Molbo's edited book, Dynamics of Problem-Oriented Approaches: Patient Care and Documentation (1976), is an excellent presentation. This book includes three major sections--"Concepts and Theories," "Implementation," and "Expansion." The similarity between problem-oriented problem-solving techniques and nursing process approaches is described. Clients' problems in illness and "wellness" and nursing diagnosis in the problem-oriented system are discussed in Section I, "Concepts and Theories."

Section II, "Implementation," includes chapters on "Holistic Implementation," "Problem-Oriented Charting," and "Implementing the Problem-Oriented Process in Home Health Care and With Other Disciplines." Chapters on "Clinical Specialization," "The Expanded Role," and "Computer Applications" are also included. Section III, "Expansion," considers "Integration of the Problem-Oriented Approach to the Patient Documentary System;" "Participative Health Care;" "Integration of Problem-Oriented Approach With Concepts of Nursing;" "Legal Implication;" and a final chapter, "Toward a Creative Professional Climate for Nursing Practice."

Meldman, McFarland, and Johnson's book, The Problem-Oriented Psychiatric Index and Treatment Plans (1976), is based on a philosophy of

a goal-oriented approach to care for behavioral problems. It includes indices of goals and methods, treatment plans, and progress notes. A five-digit code is provided for every goal and treatment method. Many of the goals defined have relevance for patient problems which are seen in both public health and general hospital settings.

Articles

Atwood and Yarnall, in their preface to an issue of Nursing Clinics of North America dedicated to the POR (June 1974), stated their intention of presenting an interdisciplinary approach to the use of the problem-oriented record by nurses. It is emphasized that "there is no single approach to the POR and that the system must be individualized to each particular practice."

In a later article in the same issue of this journal, Atwood, Mitchell, and Yarnall (1974) raised questions regarding the use of the POR in the "real world." The shift in emphasis from verbal to written communication provided by POR is discussed. Physician-nurse communication is enhanced by the system, as "physicians become better acquainted with what nurses can and should do. In so doing they become more involved in teaching and assisting nurses to practice more effectively" (pp. 222-23). The problem-oriented record makes what each person is doing more explicit and thereby facilitates trust and decreases duplication and confusion. Resistance to change is a human characteristic and must be anticipated when one considers implementation of the problem-oriented record.

Crabtree (1974) described the problem-oriented system, provided a case example of problem-orientation, and listed the advantages of the POR. Two of the ten advantages liste differ from Hurst's "Ten Reasons Why Lawrence Weed Is Right" (1971). These include sifting data and minimizing irrelevancies and documentation of the quality of patient care. She cautioned that the system is not a cure-all and requires staff education for implementation.

Cadmus (1973) discussed nursing care plans and the POMR. She stated that before the POMR nursing care plans have primarily been only student exercises. They were recorded in Kardexes and considered disposable, task oriented, and primarily illogical. The problem-oriented system is an instrument of change. The initial care plan includes nursing measures for:

1. More data,

2. Specific treatment,

3. Patient education.

Gane, in "Sparky: A Success Story" (1973), provided a humorous presentation of the principles and use of the problem-oriented record in cartoons. In an article in The Problem-Oriented System (1972), Gane stated that understanding the reasons for physicians' orders is "made possible" by the use of the problem-oriented record. Nursing care plans can be made in conjunction with the physician's therapeutic plan. Problem orientation also permits comprehensive care (awareness of all problems). Attention to specific problems fosters the patient's perception of being cared about. By recording on the same progress sheets, nursing can make a professional contribution that invites comment, action, criticism, and meaningful audit.

Gane's "Foreword to the Symposium on the Problem-Oriented Record" in Nursing Clinics of North America (1974) states that the problem-oriented system is a concept which is 15 years old and is being used by members of many disciplines. The problem-oriented system is a tool that will allow us to accept the challenge of doing what we say we believe in. In an article in Applying the Problem-Oriented System, Gane (1973) described the value of the problem-oriented system for nursing. Knowledge of all the patients' problems changed the way that the nurses on her unit practiced nursing. "Using the problem-oriented approach makes it possible for the nurse to render comprehensive care, to think of the patient as a person." The formulation of plans and the progress notes are discussed. The benefits of problem-orientation and future implications are presented.

Lambert, in a National League for Nursing monograph (1974), described the problem-oriented system as a whole philosophy of patient care with documentation of care, peer audit, and correction of deficiencies as aspects of this system. The implications of each of the components of the problem-oriented system are discussed. Defining a data base requires coordination of physicians' and nurses' efforts to avoid duplication in questioning the patient. The relevance of each question must be considered in light of the willingness to act responsibly on the basis of the answers obtained. This forces a continuous questioning and development of practice.

The problem list makes the need for care of all the patient's problems obvious. The initial plan includes consideration of the plans for patient education; the progress notes force the documentation of nursing judgments. As a result of this system (the development of a data base and defining the parameters for the care of certain patient problems), patient care at the Medical Center Hospital of Vermont has improved. All members of the health team communicate, and all are planning for the patient and with him.

Malloy (1976) questioned the appropriateness of the problem-oriented record for nursing. She stated that it is ". . . an approach to patients focused on their problems" and "is misleading if the overall goal of nursing is to assist a persor toward optimum health." "This," she stated,

"emphasizes disabilities rather than an accurate picture of both strengths (or resources) and weaknesses (or limitations)" (p. 582). In addition, "Nursing objectives are submerged to a subconscious, unstated level" (p. 582). It would be more valuable to focus on the objectives of care. "Important areas of patient care will be neglected if the same problem list is used by both nurses and physicians. Nursing must maintain its contribution of health objectives developed with the person and his family and based on nursing assessment and priorities."

Mitchell (1973) stated that the conflict between the ideal (nurses' notes are important) and the real (nurses write few meaningful notes) is resolved by the problem-oriented record. Nursing care data can be adapted to the problem-oriented format. Examples of nursing care data in problem-oriented format are provided. The advantages of the POR are discussed. These include improved patient care, increased professional collaboration, permanent documentation of care, critical thinking, and benefits for teaching nursing students. The difficulties of implementing the problem-oriented record include visibility of the nurse's clinical thinking and the difficulty of using brief flow sheets after being accustomed to narrative notes. Different professional views in defining problems can be resolved by looking at problems from the patient's point of view.

Schell and Campbell (1972) stressed Weed's philosophy of the importance of teaching a core of behavior rather than the memory of facts. The components and advantages of the POMR are described. Logical, explicit description of the patient's problems; efficacy; evaluating the team's performance; and immediate, meaningful feedback for education and audit constitute the advantages. The problem of the threat of exposure provided by the POMR is mentioned. The impact on education (the stress on behavior rather than memory), the value for research (logical, explicit data), and the common approach of nursing and medicine necessary for "expanded roles" for nurses are presented. The concepts and terminology differ little from other nonnursing presentations of the content and philosophy of the problem-oriented record.

Yarnall and Atwood (1974) stated that the problem-oriented system puts the emphasis back on the patient and his problems. Areas affected by the problem-oriented approach include the "seven C's" of: (1) care, (2) communication, (3) cost, (4) control, (5) certification, (6) consent, and (7) confidentiality. The components of the problem-oriented record are described. The first rule of implementation is "start with yourself." Do it, and individualize the system to your own practice setting.

Methods of Initiating the Problem-Oriented Record and/or System

Matthis ("The Problem-Oriented System in Public Health Nursing," 1974), a consultant to the Visiting Nurse Association of Omaha, Nebraska, described the reactions of the staff to initiating the POR. Classic patterns of denial, overt anger, quiet depression, and final acceptance were seen. The problem-oriented record is simply a new term for nursing process. The service goals of the agency should determine the data base content. The greatest part of the article refers to the steps in the nursing process. "POMR Group Exercises" (National League for Nursing, 1974, pp. 67-86) consists of a summary of reports of brainstorming approaches to methods for introducting the POMR in a combined public health and VNA organization. The content is not limited to a public health agency.

A comprehensive manual by the Visiting Nurse Association of Burlington, Vermont (1975), provides concise, specific information. The sections of this manual include:

1. The problem-oriented record--its organizing principles and its structure,
2. Guidelines for training personnel in the use of problem-oriented records,
3. Curriculum outline for training,
4. Forms used in the problem-oriented record and instructions for use,
5. Sample records,
6. Reactions to the problem-oriented system,
7. Selected bibliography.

In short, it includes everything which is necessary for establishing the use of the problem-oriented record in a home health agency. Much of the content is relevant to the use of the problem-oriented record by professional nurses in anything other than the most acute care settings. The third section of Gane's unpublished manual (1974) is entitled "How to Practice" and presents the methodology for use of the problem-oriented record in nursing. All three unpublished manuscripts by Gane, "Handbook of Problem-Orientation for Nurses" (1972), "Nursing: The Problem-Oriented Way" (1974), and "Understanding the Problem-Oriented Record: A Book of Exercises" (1975), constitute valuable resources for implementing the POMR, especially in inpatient settings.

Reports of Initiating the Problem-Oriented Record and/or System

Abruzzese (1974) reported the initiation of the problem-oriented system by the nursing staff at St. Luke's Hospital Center in New York City. A major concern was to keep nursing diagnosis and assessment within the nursing rather than the medical realm. Implementation of the problem-oriented system at the Western Pennsylvania Hospital's Department of Nursing (Davis 1974) resulted in the following changes:

1. Nurse-physician relationships included greater acceptance of the nurse as a coprofessional by the physician.

2. Nurse-patient relationships were deeper and more therapeutic.

3. Professional function was more effective with a well-defined framework.

4. The hospital was closer to the possibility of computerized records.

Both general and specific objectives for implementing the system were developed. General objectives included:

1. To create a realistic self-image of the professional nurse.

2. To create an intellectual environment where questionning and self-directed learning are positively reinforced.

3. To provide a clinical situation which offers students the opportunity for systematic clinical education.

4. To create an environment in which the nursing team is stimulated to develop thoughtful, scientific care.

Specific objectives were related to documentation of information. The POR's progress note format (the "SOAP" note) was amended to provide a format for recording interventions. A SOIAP rather than a SOAP structure was provided for the progress note. Employees responded favorably to the system, and the authors believed that the problem-oriented system of charting is the best method for documenting patient care.

The problem-oriented system was initiated in a combined agency as the result of the frustrations of attempting to audit traditional records (Kelly and McNutt 1974). A general assessment data base was developed (p. 283), and the opening summary was retained "because it helps us to see the family as people, not just as a group of problems." The SOAP format was used for both home visits and phone contacts. Difficulties in identifying format space for information which is relevant but not problem based (such as type of living arrangements) were noted, and the general rule "if you can use the information in some way, include it"

was adopted.

Kinney and others (1974) evaluated the difficulties encountered in implementing the problem-oriented record on one unit of a community hospital. They identified the following problems:

1. Problem lists were maintained by only a small percentage of the attending staff;

2. The inservice training of new nurses was a constant challenge;

3. The SOAP format overwhelmed the nursing staff;

4. The medical staff did not adopt the problem-oriented record as an official part of the chart (pp. 249-50).

A nursing coordinator for the problem-oriented record was appointed to work with the Director of Medical Education. Flow sheets for nursing parameters (care, activity, food, mentation) were designed, apparently to cover nursing problems not included in medical problem lists and nonproblem-based nursing functions related to the maintenance of the patient's normal functioning.

Payne, McBarron, and O'Connor (1974) reported the difficulties and accomplishments in implementing the problem-oriented record in a coronary care unit. Nurses began charting progress notes in problem areas defined by body systems. The authors stated that this was found to be a useful educational experience for the nurses and an effective strategy for implementing structured notes. Both general-purpose and structured, problem-related flow sheets were designed.

An editor of Registered Nurse (RN) magazine described her visit to the Medical Center Hospital of Vermont to observe the problem-oriented medical record in use (Robinson 1975). The information reported serves as a summary of the original publications of Cadmus, Gane, Milhous, and Lambert. Information not in other sources includes the following list of "Don'ts" for implementing the system. Do not:

- Ram the system down everyone's throat.

- Start where resistance is strong.

- Start with the data base and/or progress notes. Do start with the problem list.

- Wait for physicians to come around to the system.

- Do it unless you have a supporter who is on the unit.

- Ignore administrative leaders. Do include them from the beginning.

Forget to invite everybody to inservice meetings about the POR.

Thoma and Pittman (1972) reported the initiation of the problem-oriented system for recording nursing care in an extended-care facility. The assessment, planning, implementation, and evaluation of nursing care is discussed, and the findings of a chart review 3 weeks after the initiation of the system is presented (see the following studies). Thompson's report of the process of initiating the problem-oriented system in a home health agency is described in Applying the Problem-Oriented System. The final report of this project, which was in process at that time at the Visiting Nurse Association, Inc., Burlington, Vermont, was later published as The Problem-Oriented System in a Home Health Agency--A Training Manual (1975).

Woody and Mallison (1973) presented an extensive description of the problem-oriented system and its components and described the change to the problem-oriented system by nursing at Grady Memorial and Emory University hospitals. A gradual approach to adoption of the system by different units was used, beginning with the coronary care unit (see Silverman 1972 and 1973). Collaboration between medicine and nursing was required to develop the data base. Frequent auditing provided feedback to the users of the system. At first, "general" was used to designate problems of hygiene and activity, but was later discontinued. Separate nurse's notes were discontinued and incorporated into the physician's progress notes. Anxiety at writing "assessments" occurred. Kardex care plans were converted to problem lists on the hemodialysis units. Constant revision of forms was required during the early stages of development.

Applications of the Problem-Oriented Record and/or System

Nurses have applied the problem-oriented record or problem-oriented system in audit and education as well as in a variety of settings.

Functions

Audit.--Mention of the value of the problem-oriented record for audit, accountability, or peer review is made in most nursing articles regarding the problem-oriented system. These have been reviewed according to their major content. Asp and Brashear's (1973) interdisciplinary approach to audit is reported in the "Studies" section of this bibliography. In essence, the quality of nonproblem-oriented records was largely unacceptable. Both a higher initial quality and improvement of records over time were identified for problem-oriented records.

Bonkowsky (1972) initiated a program of peer review 3 months after the nurses in an outreach program which used the POMR. Each nurse evaluated 10 records of another nurse with regard to:

- Identification of all health problems;
- Presence of a plan of care for each problem;
- Clarity of the description of the current status of all patients.

Gane ("Nursing, The Problem-Oriented Way," 1974) described performance audit. She stated that it is directed to the consideration of Weed's list of four behavioral traits: (1) thoroughness, (2) reliability, (3) analytic sense, and (4) efficiency. Each of these traits is defined. Excerpts from Schell and Campbell ("POMR, Not Just Another Way To Chart," 1972) with regard to the value and the threat of audit is included. Weed's "On Being Responsible and Setting Priorities" (1973) is presented in its entirety. The Medical Center Hospital of Vermont's "Standards for Patient Care and Peer Review" and methods for review are also included.

Education, continuing education.--Hawken (1973) stated that nursing educators can contribute to the problem-oriented approach in the areas of collaboration, educative process, value orientation, refinement of the process, and sharing ideas. She also stated her belief in a common data base for nursing and medicine. Different data bases, she felt, would divide the patient. Nursing educators can assist students in developing the cognitive process necessary to use a problem-solving approach. Emotional aspects of patients are not evident in the existing guides for nursing assessment. Nurses need to consider what the information means to the patient.

The Emory School of Nursing has collaborated with the National Medical Audiovisual Center in producing a film, "Implementation of the Problem-Oriented System by the Nurse Clinician" (free distribution) which includes segments on (1) a systems approach to family functions, (2) physical assessment, and (3) continuation of the problem-oriented process. Mitchell and Atwood (1975) studied the "critical thinking" of beginning nursing students who were taught problem-oriented charting as opposed to those who were not so taught. They identified no differences in the number of patient problems identified on a paper-and-pencil test. However, the problem-oriented group did identify more problems in a clinical setting. This study is reviewed in the "Studies" section regarding the use of the problem-oriented record by/for nursing.

Role of the Problem-Oriented Record and/or System in Promoting Interdisciplinary Communication

Much of the literature regarding the use of the problem-oriented

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record by nurses or in nursing care settings is related to the value of this record system for achieving interdisciplinary communication. Two basic compilations of articles, the June 1974 Issue of Nursing Clinics of North America and the National League for Nursing's The Problem-Oriented System--A Multidisciplinary Approach (1974) deal with the value of the problem-oriented system for interdisciplinary collaboration.

Many of the articles included in these two sources are presented under the specific settings in which the use of the problem-oriented record is described. Almost all articles about the use of the problem-oriented record in nursing care settings mention its value for interdisciplinary communication and are reviewed according to their primary topics. Those articles which relate specifically to the use of the POR for interdisciplinary communication are included in the following articles. Atwood and Yarnall's preface (1974) to the Nursing Clinics of North America stressed the importance of interdisciplinary collaboration in implementing a problem-oriented record system. Each of the articles included represents an interdisciplinary effort. All but one article were coauthored by a nurse and a physician.

Lambert ("The Problem-Oriented System as an Aid to Improved . . .," 1974) stated that one of the greatest benefits of the problem-oriented system is improved collaborative planning. Nurses have never aggressively tried to demonstrate to others what the nursing content of patient care includes. The author's plan for a specific routine for home care was planned with the patient and charted in the clinical progress record. It resulted in responses from both the house staff and the attending physicians. A weekly discharge planning conference evolved. The medical records department gave permission for nurses to write in the progress notes, and respect and understanding between physicians and nurses grew. Training sessions in problem-orientation were established for all disciplines that provided care for the patient.

The process of development of a hospital-wide data base led to differentiation of content and consequently of roles of various disciplines. Problem identification and recording remained the responsibility of the physician, but a temporary problem list was used by nurses. These problems were evaluated for inclusion on the permanent problem list. Sharing written comments on the patient's behalf resulted in more consistent medical followup than the previous verbal discussions achieved.

Thompson ("The Problem-Oriented System in Home Health Agencies," 1974) stated that the POR's requirement that all information is recorded in common locations of the record results in clearer communication of the roles and responsibilities of each team member. Combining agency records with community physicians has made patient information more accessible and the contributions of the nurse more evident. Patients also have more information about their health needs, problems, and care, and as a result can make some judgments about the quality of

care which they receive. Evaluation of care is facilitated both on an individual patient basis and for utilization review because of the structured, explicit nature of the record.

Settings and Services

Public health.--Applications of the record or record system to public health settings or services have been reported by several authors. Aradine and Guthneck (1974) reported the use of the problem-oriented record in a family health service. Mechanisms for incorporating the problem-oriented record into a child development and family health care setting are described. The pediatric data base (including the scores of Denver Developmental tests) is considered to be "additive." Health assessment, supervision, and promotion are the first problem for all patients. Differentiation between nursing problems (those which are managed by nurses) and "pathophysiological problems" is approached logically. Weed's definition of a problem, "anything that requires management," serves as the basis for this distinction. Management of a medical problem may constitute an additional nursing problem.

Flow sheets have been devised for health supervision of children from birth to 2 years. Forms are considered a tool, rather than a rigid format, and are used in combination with interviewing skills. An overall plan incorporates items for all problems and is recorded in complex situations. The authors stated that "the system . . . needs further development in the areas of health education and in recording patient and family goals, strengths, assets, and abilities as well as the problems they present" (p. 1112). They concluded, however, that patient care has been improved and continuity of care strengthened by the use of the problem-oriented record.

Bonkowsky (1972) described the use of the POR by nurses in three satellite clinics of Children's Hospital in Washington, D.C. A data base was defined and Problem 1 of the problem list was always "well child" or "routine health supervision." Three months after the problem-oriented system was initiated, peer review of records was begun. Some staff members other than nurses began to use the system as well. The advantages of the system included increased comprehension of the patients and their complex problems, increased stimulation and professional satisfaction, and better continuity of care with transferred caseloads.

Field (1971) stated that physician, nurse, and patient are separated by innumerable barriers to communication. A community health coordinator based in a hospital (Dartmouth-Hitchcock Medical Center) suggested the use of the POR format to a few community nurses. Community nurses were invited to participate at a problem-oriented workshop in the hospital. The problem-oriented record improved communication between nurses and physicians and thereby improved patient care.

Matthis' article (1974) dealing with initiating the POR and Kelly

and McNutt's article (1974) dealing with implementing the POR are both applications to public health agencies. However, each is considered elsewhere in this review. Thompson (in Hurst and Walker 1973), stated that the semi-isolation of a home health agency facilitates the initiation of the system by diminishing the problems of redtape and by obtaining a consensus of a mixed group of professionals. Problem-oriented reports to physicians resulted in their increased awareness of the role of the public health nurse in relationship to their patients. Third-party payers even found a change in forms acceptable.

Dr. Laura Weed served as consultant in the changeover to problem-oriented records. Records were developed, field tested for 6 weeks, revised, and tested again. The conversion was relatively painless, and staff acceptance was great. The components of the problem-oriented record and the forms used for each are presented with a case example. Audit is performed more easily with the problem-oriented record. Initiation of the system was an exciting endeavor, and the author stated: "it offers nursing an opportunity to define its practice and to communicate with other professionals in a sophisticated, logical, and very patient-centered way."

In her article "The Problem-Oriented System in Home Health Agencies," Thompson stated that the problem-oriented system is so logical and so practical that one wonders why it did not originate earlier. Although nursing process and other approaches were similar, they were not useful to other disciplines and health care providers. A grant from the Department of Health, Education, and Welfare facilitated the initiation of the system for this agency. A pilot group of staff was formed, and Dr. Laura Weed served as consultant. Record forms were studied, established, tested, revised, and a final form was established. Flow sheets for diabetes mellitus, cardiac disease, and antepartum care are included.

In the next article in the same monograph, Thompson (1974) described the program in which the Visiting Nurse Association of Burlington, Vermont, began to combine records with community physicians. Problem-oriented referrals now come from a variety of sources and yield a more complete picture of the patient. Both coordination of planning and evaluation of patient care have been improved. The Visiting Nurse Association of Burlington, Vermont (1975), published a training manual as a result of a Division of Nursing, Department of Health, Education, and Welfare, grant. This comprehensive source of information regarding the initiation of the problem-oriented system in a home health agency is reviewed under "Methods for Implementing the System."

Ambulatory care settings.--Applications of the problem-oriented record and/or system in ambulatory care settings have been described by Brydon (1973); Taylor (1973); and Leonard, Coward, and Mattingly (1974). Leonard and others (1974) included a health maintenance flow sheet from birth to 12 months. This flow sheet includes criteria for both the child's development and family behavior.

Rehabilitation settings.--Application of the problem-oriented record and/or system in rehabilitation settings have been described and reported by several authors. Berni and Nicholson (1974) described the use of the problem-oriented record for patient care and teaching in a rehabilitation program. A flow sheet for bowel training is included. Conti (1975) used the problem-oriented record as the basis for her annual report for the Department of Nursing at the Maryland Rehabilitation Center. The number and percent of patient problems resolved by nursing were used to document the success of nursing care.

Psychiatric settings.--Applications of the problem-oriented record and/or system in psychiatric settings have been described by several nurses. Gerken, Molitar, and Reardon (1974) presented the methods and difficulties of the transition from a source-oriented to a problem-oriented system in three State hospitals. They found conversion of records of long-stay patients to be very timeconsuming, but valuable in uncovering problems that had been neglected. Behavioral observations, rather than physiological parameters, provided the basis for assessment. The POR provided a more unified approach by the treatment team. A problem classification guide and sample problem list treatment guide are provided. Hawley, Smith, and Grant (in Walker, Hurst, and Woody 1973) described the audit process as applied to psychosocial care. Huff (in Walker, Hurst, and Woody 1973) presented a data base developed for use in a psychiatric inpatient service at Grady Memorial Hospital, Atlanta, Georgia.

General hospital settings.--Nursing applications of the problem-oriented record and/or system in general hospital settings were described by Gane and others. Chapter 6 of Gane's mimeographed manual (1974) includes sample records from medical-surgical, rehabilitation, coronary care, obstetrical units, and the emergency room. Cadmus (1972) described her experiences with the problem-oriented record on the gynecology unit at the Medical Center Hospital of Vermont as "a system that truly places the patient at the center. Now we are able to see a person with problems and in turn, we strive to establish ourselves as persons working to solve them." Kinney, Smith, and Barnes (1974) included a flow sheet for activities of daily living in their article on the use of the POS on a medical unit of a general hospital.

Acute care and coronary care settings.--Applications of the problem-oriented record in acute and coronary care settings have been presented by Payne, McBarron, and O'Connor (1974) and Silverman in both The Problem-Oriented System (1972) and in Applying the Problem-Oriented System (1973).

Studies Regarding the Use of the Problem-Oriented Record and/or System

Asp and Brashear (1973) surveyed physicians' and nurses' responses to the initiation of the problem-oriented system. The survey was conducted twice during October 1972 and February 1973. Thirty-two of forty nurses responded during the first survey and 36 of 40 during the second survey. The questions and the nurses' responses during the two surveys are presented as follows:

	Response "yes" Oct.	Feb.
	Percent	
1. Has the POMR changed your response to the patient?----------	18	55
2. Do you believe that your care of patients has improved?----------	38	50
3. Do you feel the chart is more useful to you?----------	97	72
4. Has the POMR improved communication between all involved in the care of your patient?----------	75	56
7. Does the POMR increase your time invested in patient management?-----	19	39

Questions 5 and 6 were answered by physicians only and refer to consultation and length of stay.

The nurses, although responding favorably, were less positive than the physicians (14 of 20 M.D.'s responded on both occasions). More nurses responded "yes" to Questions 1, 2, and 7 during the second survey than during the first. Less responded favorably to Questions 3 and 4 after the time lapse. However, it was to these two questions, "improvement of patient care" and "utility of the chart" that more nurses responded favorably.

Bertucci, Huston, and Perloff (1974) compared problem-oriented and traditional methods of charting. A sample of 15 subjects was taken from each of 2 groups of registered nurses. One group had previously been taught the Weed system; the other had not. Both groups were asked to respond to five paper-and-pencil patient care situations by writing nurse's notes as if they had been assigned to the care of the patient. Criteria for evaluation of the information recorded consisted of each of the components of the SOIAP note. A score of "1" was given for each criterion included. Not surprisingly, the group who had been taught the Weed system included a higher number of its components in their recording than those who had not been taught it. Many participants in both groups did not record assessment and direct nursing intervention. Four participants in group 1 and none in group 2 held baccalaureate degrees.

Bloom (1971) identified the value of the problem-oriented system for organizing information, thoughtful practice, awareness of the patient's problems, and awareness of relationships between problems. Freedom for independent nursing judgments and improved relationships between disciplines are among the values of the system. The last page of this article describes a pilot study of record style and content and an evaluation of patient care on the physical medicine unit. Patient care was improved, and the new chart content facilitated continuity of care between shifts and over longer periods of time. No numerical results were reported.

Foss and Magill's pilot study (1974) of the effects of the problem-oriented record on the recording of patient care activities was conducted in two phases during the initiation of the system in the hospital's nursing service. In phase I, workshops were conducted for selected units to prepare for the use of the POMR by nursing. The audit of 24 randomly selected charts (12 from traditional and 12 from problem-oriented charts) showed great improvement in the problem-oriented charts, compared with the traditional notes. Evidence of a beginning nursing care plan, listing more specific nursing interventions, and inclusion of the patient's emotional reactions to illness and to care appeared more frequently in the problem-oriented records. A questionnaire was distributed to the nurses, and the majority stated that they preferred the problem-oriented system and that it made them think more about documenting nursing assessment before beginning care. They did feel that the POMR was more timeconsuming and that it needed modifications.

Phase II was conducted to compare the traditional POMR format with the modified form (the "S" and "O" of the SOAP note were dropped, and these responses were included within the assessment). The audit of 11 POMR and 13 modified POMR charts showed only slight improvement in the modified POMR, compared with the traditional POMR format. A questionnaire found that the nurses felt that the system was more timeconsuming only in the initial stages of use. More than half stated that there was no difference in patient care due to the modified POMR. Mantle and others (1973) analyzed nursing flow sheets in an acute care unit. The notes were compared with a "problem-oriented theoretical standard." The content of the recorded notes was found to be significantly below the standard.

Mitchell and Atwood's study (1975) was designed to test problem identification; documentation of plans, actions, and evaluations; and quality of the organization of records in students who had been taught the problem-oriented system, compared with those who had not. Sophomores in a baccalaureate program in nursing were divided into 2 groups of 73 each. The study group was taught the problem-oriented format; the control group was not. Instructors for both groups stressed the inclusion of the patient's subjective responses; nurses' observations; inferences based on data; and plans, actions, and evaluation as the ideal content of the record. It was also stressed that both groups should complete information regarding one subject before beginning another topic.

Three samples of the student's clinical charting were obtained at the 2d, 6th, and 9th weeks of the school term. A paper-and-pencil test of a written case history was given on the 9th week. The hypotheses stated that the experimental (problem-oriented record) group would do better than the control group with regard to problem identification and documentation of problems. None of the hypotheses were supported for case history ("paper-and-pencil") material. Mixed findings were reported for the clinical recording of the two groups. More problems were identified and the documentation of plans, actions, and evaluation was significantly greater for the group of students who had been taught the problem-oriented method.

Mooney (1972) compared problem-oriented and nonproblem-oriented nurse's notes. She found that both the administration of prn medications and the patient's responses to the medication were recorded significantly more often in the problem-oriented than in the nonproblem-oriented nursing notes. Thoma and Pittman (1972) tested the concept that the content of the record form reflects the expectations of the form. An audit was conducted after the problem-oriented forms had been used for 3 weeks. The criteria for audit and the findings were:

1. Nursing problems had been identified and listed on the appropriate form. All patients had five or more problems identified.

2. a. Nursing care plans were present for each problem.
   b. Nursing care plans were consistent with nursing assessment. It was found that plans were less likely to be recorded if the problem was added after the forms for the patient had been started.

3. a. Charting of care was related to the nursing problem.
   b. Charting of care included an evaluation of how the care plan was working.

The authors stated that charting nursing care reflected the nursing care plan for the patient. If the care was consistent with the plan, no specific charting was required. Rather, evaluation of the patient's problem was recorded. The flow sheet for recording dependent nursing functions was difficult to use, and the nurses felt that it did not provide adequate legal protection. It was dropped, and the previous forms were retained. No numerical findings were presented. The author concluded that problem-oriented charting has been useful in documenting the level of skilled care in the extended-care facility.

Savett and Good (1973) established a program of continuing education for nurses in order to develop the nurse's three roles: data collector, decisionmaker, and teacher of patients. Four nursing stations were selected on which to implement the program. The nurses on each unit were instructed in the use of the problem-oriented system. During the week after the system had been implemented, the nurse investigator visited the unit, reviewed records, and moderated sessions with the floor nurses. A

chart on a current patient was reviewed. Nurses identified more patient problems and acted on them (no source of comparison or numerical results were reported).

A questionnaire regarding the impact of the POR on practice was answered by "about 50" nurses. Most felt that the POR had increased their awareness of the reasons for admission and for the specific treatment of their patients. They also felt that they had become more skilled in identifying new problems and in seeking their causes. The nurse's role as teacher of patients became more visible and more integrated throughout the patient's hospitalization. Most nurses reported more work satisfaction and an improvement in self-image. The questions, results, and framework of this investigation are significant. The question of whether or not the teaching sessions conducted by the nurse investigator might have produced improved charting without the POR cannot be answered by the method used in this study.

Manuals, Workbooks, and Forms

The National League for Nursing's publication, Problem-Oriented Systems of Patient Care (1974), consists of papers presented at a workshop series. Many forms that were developed for use with the problem-oriented record are included. Vaughan-Wrobel and Henderson (1976) differentiated between the problem-oriented record and the problem-oriented system in their workbook. They described each and provided extensive exercises in the use of the problem-oriented record.

The Visiting Nurse Association, Inc., Burlington, Vermont (1975), prepared an excellent training manual. It was designed for home health agencies and is available commercially. It is reviewed in the section entitled: "Methodologies for Implementing the Problem-Oriented System in Nursing."

Nursing Innovations and Adaptations of the Problem-Oriented Record

One innovation in the problem-oriented record was suggested by Davis (1974). The addition of an "I" for intervention was incorporated into the SOAP note. St. John and Soulary (1973)suggested a goal-oriented, rather than a problem-oriented approach. They stated that this produces a growth-oriented, rather than a pathology-oriented approach to care.

Nursing Process and Problem-Oriented Approaches

A few articles deal with the congruence of nursing process and problem-oriented approaches. Abruzzese (1974) believed that nursing process and problem-oriented systems are similar in that each is both very simple and very complex. Efforts to maintain the differentiation of nursing (diagnosis and treatment of human response to illness) and medicine (diagnosis and treatment of the illness itself) are described. The Department of Nursing of St. Luke's Hospital Center, New York City, was able to gain acceptance of a nursing data base by the medical records committee after the problem-oriented medical record had been adopted.

Bloom, Molbo, and Pardee (1974) used the adaptations of the problem-oriented system described in Bloom's previous article (American Journal of Nursing, 1971), in which the components of the progress notes were altered to be congruent with the components of nursing process: (1) observations, (2) assessment, (3) goals and plans, (4) action, and (5) evaluation. The major focus of the article was planning to implement the change to problem-oriented charting using the modified format. Planning for initiation of the system included: (1) consideration of the impact on the organization, (2) responsibility, (3) accountability, (4) communication, and (5) preparation.

The last section of Browning and Minehan's (1974) compilation of articles regarding nursing process includes several articles on the problem-oriented system under the title "Future Trends." The similarities of nursing process and problem-oriented approaches are presented in the third section, "The Problem-Oriented System and Nursing Process," of Gane's mimeographed work (1974). Nursing problem and nursing treatment typologies from Abdellah and others' Patient Centered Approaches to Nursing are listed along with the equivalent components of the problem-oriented record to identify the similarities between these two approaches.

Lesnick and Anderson's list of six independent and one dependent function of nursing is also included. The elements that correspond to the problem-oriented record are underlined. Convinced that the nursing process is applicable in any practice setting, Matthis (1974) stated that the problem-oriented system is simply a new name for the nursing process. If the underlying concepts are well understood, a certain amount of practice will make recordkeeping simpler and more pertinent (p. 50). The author then described the steps of the nursing process: (1) observation, (2) assessment, (3) planning, (4) establishment of objectives, (5) intervention, (6) evaluation, (7) plan revision, and (8) total reassessment. Mitchell (1973) stated, "The Problem-Oriented format is an ideal vehicle for documenting all aspects of the nursing process" (p. 196).

Niland and Bentz (1974) stated that nursing process and particularly nursing assessment are interpreted differently by different authors. Various definitions are provided. All of the definitions, however, are consistent with the problem-oriented system with regard to the process of seeking information for problem identification and analysis, problem solving, and evaluation. "The problem-oriented record," the authors concluded, "can be used to implement the nursing process in an organized and effective manner" (p. 245). Nolan's (1974) description of problem-solving activities is much more differentiated than the four or five components usually described. Nolan organized information-seeking strategies differently than most writers on the nursing process (often called "problem-solving") approach. She stated that a problem is first identified, and then information is sought about prior experiences with similar problems.

The need for documentation of skilled nursing care for third-party payment provided the impetus for Thoma and Pittman's investigation (1972). Nursing process, based on the scientific method, includes assessment, planning, implementation, and evaluation. The problem-oriented record was chosen to facilitate documentation of these activities, and forms were designed to encourage nurses to follow this format. These included a problem sheet, nursing care plan, nursing notes, and a flow sheet. The revised forms were evaluated according to the following criteria:

1. Were nursing problems identified and listed on the appropriate form?

2. Was a nursing care plan formulated for each problem identified and was it consistent with the nursing assessment?

3. Was the charting of nursing care related to the nursing problem? Was there an evaluation of the success of the nursing care plan? Could the patient's progress be identified from the record?

The article attempts to deal with nursing process and the problem-oriented record as if there were a one-to-one correspondence, rather than a high degree of similarity. As a result, there is some confusion with regard to this issue in this otherwise excellent report of instituting the problem-oriented record in an extended-care facility. The first chapter of the Washington, D.C., Veterans Administration Manual (1974) includes a section on nursing process approaches to recording patient care. The components of the nursing process are listed as: assessment, planning, intervention, and evaluation. The nursing care plan has improved patient care planning and raised awareness of the other components of patient care. Assessment has been the most difficult component to implement. The problem-oriented system "is what the nursing process is all about" and can solve many of the difficulties

in implementing this approach to recording care of patients.

D. THE COMPUTERIZED PROBLEM-ORIENTED RECORD

Introduction

The problem-oriented record is a method of organizing patient and patient care information. The computer provides the ability to store, process, and distribute information. The computerized problem-oriented record system provides, therefore, a method for storing, processing, and distributing patient and patient care information.

Background

There is no mention of computerization in Weed's first article on the problem-oriented record which appeared in the Irish Journal of Medical Sciences in 1964. A "New Approach to Medical Teaching" (1966) makes no specific mention of the computer, but does include two concepts which are specifically related to computerization: better care results from the availability of information (p. 1036 in Medical Times) and the mistake of placing major emphasis on "feats" of memory in training physicians (Ibid., p. 1037). In addition, the problem-oriented record is referred to as a system, a word which often triggers the thought of computerized-information systems.

The first article by Weed (1968) which specifically mentions computerization of the problem-oriented record was published in the New England Journal of Medicine in 1968. In order to deal with the frustrations in medical action, a more organized approach to the medical record, a more rational acceptance and use of paramedical personnel, and a more positive attitude about the computer in medicine will be required. Slack's work with a computerized form of history taking, using direct, typewritten input; branching questions; and a cathode ray screen is mentioned. This, Weed said, would guarantee every patient a minimal recorded data base. The physician will always be expected to enlarge this information and integrate it with that which he has elicited himself. "In this way the recorded historical data will not be based on a single encounter with anyone and the risk of important omissions will be reduced" (pp. 595-96).

The manual problem-oriented record provides a basis for computerization. The computerized form will allow all data regarding a specific problem to be retrieved immediately and sequentially. Prepared displays provide both ease and freedom of expression to the physician.

The prepared sequences of displays will train the physician to formulate problems consistently, completely, and accurately.

Weed's article (1972), "Background Paper for Concept of National Library Displays," in Hurst and Walker, eds., The Problem-Oriented System, includes sections by several authors. Laura Weed's (1972) section, "Initial Goal for the Development of the Medical Content of the PROMIS System" (pp. 261-62), presents the goals and process of development of the content of the PROMIS System, primarily with regard to the pharmacological content. "The ability of the physician user to interact directly with the medical content . . . and the coupling of the universe of medical content to specific problems are the two major characteristics . . . which underlie the approaches to developing the medical content" (p. 261).

Drug information frames were developed by a physician (Nelson) and a pharmacist (Gilroy). Frequently used drugs were emphasized, since these are the usual cause of adverse reactions. Nelson and Bassett's (1972) section, "Use of the Computer in Arriving at Diagnostic Plans" (pp. 262-64), deals with the procedure and frames developed for assisting the physician to develop his diagnosis. The conclusion to this set of "sections" stated that: "It is apparent that the medical content of the system can be viewed as a textbook or encyclopedia organized in a structure determined by two considerations:

1. The problem-oriented approach in which current observations are systematically linked to each of the patient's problems.

2. The computer tool itself, which permits an overexpanding body of medical knowledge to be coupled, via the computer, to each of the patient's problems, not retrospectively, but 'on line'" (p. 265).

Concepts and Philosophy

General

Hayes-Roth, Longabaugh, and Ryback (1973) focused their article on the information needs of a mental hospital system. The principles identified, however, are applicable to any care setting, whether computerized or not. As in any general system approach, they are also applicable at many levels of organization: the hospital, the unit, or the individual patient care team. The authors stated: "The complexity and informativeness of the MIS (management information system) must not be less than that of the system itself. Otherwise the system is constrained to failure . . . (because of) the inadequacy of the information on which it bases its actions" (p. 320).

Feedback returns information regarding the success of performance to those who originally carried out the action (provided the care). Identification of the methods by which information regarding the success of actions can be returned to the actors is the first step in assuring successful care. This information, however, is based on extremely complex patient variables. Applying Hayes-Roth's earlier principle, it becomes obvious that the information returned to the providers of care must include all of the complexities regarding the "patient-as-system."

Information regarding the individual patient provides a microcosm (or minisystem) of the performance of the entire system. Four components of an information system which are especially relevant to the control of the patient's care program are:

1. Data on the history and classification of the patient,

2. The problem,

3. Treatments and tests performed,

4. Progress (p. 327).

The problem-oriented record provides a one-on-one fit for meeting these information needs, and the problem-oriented record can support the transition to the computerized problem-oriented record. The authors also noted a concept which is useful in a variety of settings. The differentiation which occurs with any sort of specialization brings with it a simultaneous need for integration in order to keep the activities of the specialized elements in accord with the goals of the system as a whole.

Weed and Schacter (1969) presented a list of the objections and questions most frequently posed by visitors to the PROMIS Laboratory. The questions presented and their answers include:

1. The problem list frequently results in fragmentation of diagnostic entries. This is answered by the statement that, "if a complete analysis is done on each finding, integration of related findings occurs clearly and inevitably" (pp. 275-76).

2. It would take forever to list all the problems on some patients. Provision of one problem, "multiple somatic complaints," in the computer system provides for this pattern (pp. 276-77).

3. The problem-oriented record demands too much data and is therefore too timeconsuming, rather than allowing the physician to screen for the relevance of each patient complaint. The answers are:
   a.) The problem-oriented system does not require a certain

size data base, only that the data base be specified. "Incomplete data base" may also be considered as a problem to be entered on the problem list.

b.) The physician should establish priorities and direct his attention accordingly.

c.) Insufficient time is an argument for the use of paraprofessionals to perform such tasks as gathering the data base (pp. 277-78).

4. A specialist does not have the time to create a complete problem list. A specialist functioning as a consultant should have the problem list presented to him (pp. 278-79).

5. When computers or paramedical personnel record a patient's history, the nonverbal communication between doctor and patient is lost.

a.) The physician can repeat those parts of the history that seem to require personal communication.

b.) Thinking that nonverbal communication is beneficial to eliciting a full history is a mistake.

c.) Comparison of computer-obtained and physician-obtained histories showed that the number of facts gathered by the physician and not the computer was quite small. Emotional responses were rare in the physician's record, but were elaborated in detail in the computerized record.

Other questions related to: emergency situations in which the computer is a tool, improvement of the quality of medical care, expense (which is countered by savings from the indirect costs of missed problems and lost test results), the synergism of the interaction between bits of information for cost accounting, and memory and the implications for medical education. The following exercpt from a grant application by Weed (1973) identified the goal of the PROMIS system to be: "Establish for a defined population and their health care providers a health information system with a feedback loop for corrective action. The system must allow evaluation by preserving not only the data, but the logic of all decisions recorded in the system" (p. 93).

The six central principles of the PROMIS group are quoted:

1. The basis for the health care information system is a single-unit health record kept for each member of the population for his entire lifespan.

2. The unit health record is organized so that all problems are immediately apparent and so that not only what was done for each problem but why it was done and what the results were are discernible.

3. The basic tool medical personnel use to create the unit health record has built into it the currency of information and param-

eters of guidance reducing the user's dependency on memory while allowing him to participate in the system's growth. Such a system requires computer technology to manage the massive amount of information.

4. The form in which unit health records are stored in the system must allow efficient retrieval for both individual records and groups of records to be used for population studies. Preservation of recorded medical logic provides a feedback loop for the audit of both the user's performance and the system's functioning.

5. The unit health record is accessible around the clock at all locations where health care is provided.

6. The system's building blocks (hardware, instrumentation software, medical content software) permit expansion or contraction to serve many different medical settings and geographic areas in a manner that keeps quality constant as the scale of the operation varies.

The major concept presented in Cantrill's article in Hurst and Walker (1972) is that of the computerized problem-oriented system as a force for the integration of information regarding patient care. Synergistic effects would result from the relationships between different bits of information. Information regarding all aspects and all settings of an individual patient's experiences with care would have a powerful impact on the quality of care. Ethical issues in the allocation of resources resulting from population studies could be considered intelligently.

Chapter 10 in Weed's Medical Records, Medical Education, and Patient Care (1969) was prepared by Stephen Cantrill. He stated that the computerization of the medical record can be an aid to every phase of medical action. The computerized medical history:

1. Has clearly defined content, independent of the physician's interest, time, and competence;

2. Does not require any expenditure of a physician's time;

3. Can be checked by the physician for accuracy;

4. Guarantees a minimum data base;

5. Is legible (p. 110).

High-speed branching questions allow a dialog in which each question depends on the patient's responses to earlier questions (p. 111). Problem formulation is also facilitated by branching. Some information is gained,

and some is lost in the computerized approach to history taking. Relevant information, however, can be typed into the system, or the standard displays may be altered to include it. The sequence of displays may also be altered. Some physicians prefer to isolate general symptoms, such as weight loss, fatigability, fever, and malaise before beginning a detailed analysis of one symptom. There is evidence that such a method is useful in prognosis (p. 117).

Computerized accounts provide a certain sameness of expression, which some physicians feel loses a certain delicacy of expression. However, it is the combinations of descriptors which provide the uniqueness, and the possibilities are almost endless. "Art" was never meant to be applied to undisciplined casual accounts . . . true art lies in the imaginative interpretation of, and action on, multiple variables that are defined consistently and analyzed accurately. The application of the computer to diagnostic problems has not been successful, because patients do not provide either single or mutually exclusive problems.

The computerized problem-oriented approach can make a dynamic cost-accounting system possible. Specific utilization of medical resources and costs can be identified. The introduction to Weed's Supplement to Medical Records, Medical Education, and Patient Care (1969) provides valuable concepts and philosophy regarding the computerized problem-oriented system. The concept of information as energy (credited to Peter Drucker) is presented in a clear and engaging manner. Differentiation between the distribution and the production of energy is drawn. The statement is made that "the computer allows a speed and multiplicity of correlations of action and knowledge never before attainable" (p. 5). The remainder of this work is a detailed description of the system (pp. 6-164), followed by a conclusion, "Education, Medical Care and the Computer" (pp. 164-71).

In his article, "Technology Is a Link, Not a Barrier for Doctor and Patient" (1970), Weed stated that information is energy. The computer can do for availability of the informational energy what the electric light and the motor did for the availability of electrical energy. Before the computer, "there was no central superbrain, complete and up to date, acting as a standard to which all could turn" (p. 81). Prior to the computer, the central storehouse of "information energy" was the medical library; now it is possible to develop a library of displays which can be linked to a variety of problems. The latest information, precautions, and options become immediately available to the physician who uses the computer to define the problem or treat the patient.

A communications system linking the present independent, uncorrelated islands of intellectual activities will, it is hoped, reinforce that which is right and force abandonment of that which proves false. Students should be required to change information displays in the computer, documenting the evidence as they do. No individual takes com-

plete care of the patient; a whole system is required to do that. The issue of sympathy is raised. A new kind of sympathy, in which the individual "knows what to do, has the courage and ingenuity to do it, and the good nature to be willing to do it" (p. 83), is essential to make sympathy constructive. On a larger level, concern for social problems, coupled with technology, can likewise be turned into constructive action.

Graves (1971) identified the problems encountered in attempting to design a study to compare the effects of the computerized problem-oriented record (C.P.O.) with the manual, source-oriented record (M.S.O.). Three problems were identified:

1. Identification of operational definitions;

2. The lack of a conversion factor for the states of medicine at two different times and with two different scales of measurement, the M.S.O. and the C.P.O.;

3. Identification of the effect of the measurement on the measured (Modern Hospital, p. 105).

In order to measure the quality of care as reflected in medical records, the records must be similar with regard to:

1. The range, detail, organization, and availability of the data base;

2. The degree to which the logical pathways are evident.

M.S.O.'s are not so structured and therefore cannot be compared either with other M.S.O.'s or between M.S.O.'s and other record formats. In addition, the form and content of the medical record does, in itself, affect the quality of care.

The C.P.O. is a powerful tool to improve medical reality and the quality of care in a way that is not possible with the M.S.O. record. Weed's presentation at the University of Colorado School of Medicine ("Not As a Scientist," 1967) compared medical practice and scientific research. The physician is often confronted with urgent clinical problems in clusters. The computer may offer a way out of the confusion of information currently recorded in the medical record.

Confidentiality

Weed ("The Public's Needs Must be Met," 1974) stated that the concern regarding confidentiality should be secondary to that regarding the ability to obtain and communicate adequate information for patient care. In medicine, what you don't know Can hurt you. There are two

ways to approach the problem of confidentiality:

1. Confine the flow of medical information exclusively to accredited and properly motivated providers of care,

2. Worry less about it.

"Confidentiality is just another word for secrecy" (p. 23), and preoccupation with it is counterproductive. The abuse of information may be eliminated by teaching children how to deal with personal information fairly and wisely. There will never be a system which guarantees perfect confidentiality while simultaneously providing coordinated care for an individual over a period of time. Providing individuals with their own medical records may also change the attitude about what information should be considered "private." The individual would have information about the causes of his own health problems and be more tolerant of others' health problems. If there were greater openness and candor, there would be less need for secrecy.

The issue is raised as to whether or not any health professional has the option to exclude information about a patient from his record if he thinks the care will suffer. Fears of invasion of privacy may cause some patients to withhold information. Society's long-term goals conflict with the individual patient's need for privacy. "The blunt fact is that there will be times when society's needs override those of the individual." The "physician walks a tightrope between these conflicting demands" (p. 26). Good medical care can result only from good medical information.

Rumsey's (1974) opposing viewpoint is printed next to Weed's article in the same journal. Any centralized data bank saves space and handles information more efficiently, but raises three vital questions:

1. How will the information be used?

2. Who will control it?

3. Who will pay the bill?

Data acquisition and sale are big business. Third-party payers, government, or private insurance companies develop screens and profiles of patients in order to evaluate care and to determine payments. The exchange of information should be limited specifically to those with a legitimate need to know about some aspect of a patient's situation. Patients' confidences can be kept by ensuring that:

1. Good records are prepared, and their security is protected.

2. Records are surrendered only when one is presented with a

properly executed subpoena.

3. A well-edited summary is sent when it is legally proper to do so.

4. Peer review mechanisms are kept in physicians' hands.

In conclusion, the author stated: "our responsibility will always be to our individual patients--and a crucial aspect of that responsibility is the protection of confidentiality" (p. 26).

Empathy

In "Computers and Compassion" (1975), Weed refuted the objection that computers take the compassion out of medicine. He stated that: "We've all read the science fiction that tells of times in the future when persons with the most appalling injuries and illnesses are in the care of an infallible machine which painlessly makes them like new. Can you imagine any person really sick or in pain who wouldn't welcome such a miracle?" (p. 95). Nies (1973) objected to the value of the computerized problem-oriented record on the basis of the loss of the "critical interface between the data collector and the patient." As a result of the loss of this interaction, the information obtained is less valuable and "bad data recorded in bad language" become part of the "garbage in, garbage out" syndrome.

Gertzog (1970) compared Weed's problem-oriented and Acheson's medical record linkage system. The primary area of similarity is their underlying value systems. Both stress the role of medical records as a tool for improving patient care. Acheson's system (p.677) stresses the need for linking information about patients obtained from different care settings. The author suggested that the problem-oriented structure might provide the mechanism for selecting the information to be linked in Acheson's system.

Descriptions of the Computerized Problem-Oriented System

General

Part 7 of Hurst and Walker's book (1972) includes four articles on the computer and the problem-oriented system, with articles by Schultz, Cantrill, and Morgan (1972); Gane (1972); Weed and others (1972); and Cantrill (1972). Schultz and others (1972) stated that the "paper" problem-oriented record provides the philosophical basis for the computerized system. Computerization, however, "augments its medical capabilities by making it possible to retrieve all data on one problem in sequence and by allowing data to be organized separate-

ly from its source in the record" (p. 203). It enables the audit of patients with similar problems or of a physician's logic in the treatment of one patient's problems.

The work of the PROMIS group was originally built on the system being developed by Medical Systems Research Laboratory of Control Data Corporation. A description of the computerized problem-oriented record system is included. Descriptions of branching displays, the logic of assignment of information to categories, and methods for the retrieval of information are presented. An extensive example of a patient record provides both an understanding and a feel for the content and the organization of the computerized problem-oriented record. The author concluded: "we are finding in medicine through the computerized problem-oriented record . . . that the amplification and interactions among the components of the system may at times be more important than the components themselves" (Schultz and others, in Hurst and Walker, p. 249).

Mittler (1972), a physician from the Duke University School of Medicine, reported his visit to the computerized Ob-Gyn unit at the Medical Center Hospital of Vermont. His description of the current issues in the use of the computerized problem-oriented record includes both positive and negative aspects. After presenting the problem-oriented record and its applications to nursing, Phillips (1972) discussed the computerized problem-oriented record. The online conversational interaction between the physician and the computer in combination with the branching displays allows the physician to pursue only those topics he chooses.

Walton (1973) defined PROMIS as "a computerized, online, display-based, interactive, medical information and record system organized around the principles of the problem-oriented philosophy" (p. 10). The PROMIS system, including the terminals used, the display frames, and the current status of the development of the system, is described. The implications of the PROMIS system are presented. These include the decreased need for memory of medical information, the currency of medical information which can be maintained with the system, the ease of quality control and audit, and the value of the system for research and planning. Walton stated that: "meaningful and comparative data bases will exist on large numbers of persons and will permit extensive investigations into correlations and patterns of findings and problems, and processes and outcomes" (p. 19). It will thereby enable more rational health services planning and resource allocation.

Weed (Supplement to Medical Records, Medical Education, and Patient Care, 1969) presents the most technical description of the computerized problem-oriented record. The three basic functions of the computer are to:

1. Provide the branching framework,

2. Translate the selections into data that can be read or stored,

3. Retrieve data either on the screen or on the printout.

An overall description of the system, the use of the SETRAN interactive program, a glossary of terms, and a detailed description of the contents of the frames for recording the physical examination are provided. The initial pages are an invaluable resource for those interested in developing the technology for a computerized problem-oriented system. The bulk of the information relates to the specifics of the physical examination. In one section of Your Health Care and How To Manage It, Weed ("Medicine and the Computer," 1975) noted the importance of the computer as a resource for reducing the limitations of memory-based medical care. An extensive example of the process is provided for a patient with complaints of nervousness and anxiety.

Components

Data base.--Cantrill's appendix to Weed's Medical Records, Medical Education, and Patient Care (1969) presents the questionnaire developed as an initial attempt in the construction of a cathode-ray-tube-based, patient-administered, past medical history and symptoms review (p. 133). The frames used for the physical examination component of the data base are presented in Weed's "An Atlas of Physical Examination Abnormalities" (1969). A questionnaire which can be used for one part of the data base is reproduced as the Appendix to Weed's Your Health Care and How To Manage It (1975). This can be used either manually or in a computerized form.

Problem list.--No articles specifically related to the problem list in the CPOR were identified.

Plans.--Nelson and Bassett (1972) presented the "Use of the Computer in Arriving at Diagnostic Plans" in Weed's "Background Paper for Concept of National Library Displays" (pp. 262-64).

Progress notes.--Computer displays are shown in Weed's Your Health Care and How To Manage It (1975). These reflect the minimum outlines of thought that the health care provider should have to go through.

Initiation and Acceptance of the Computerized Problem-Oriented System

Donaldson (1973) stated that the acceptance of the manual problem-oriented record was rapid. However, acceptance of the computerized POS has been much slower. The medical profession will first learn the

manual problem-oriented system and then proceed to its computerized form.

Applications of the Computerized Problem-Oriented Record

Applications of the computerized problem-oriented record have been described both from the viewpoint of its value to the functions of audit and education and its value to different settings and services.

Audit and Education

Conway ("On the Significance of the Problem-Oriented Record in Quality Control of Health Care," 1973) stated that two conditions are necessary to enforce correspondence between the process of care and the record. The computer must be:

1. Convenient to use;

2. A contributor, used concurrently and not just "after the fact."

One contribution of the computerized problem-oriented record i in the presentation of options at every point involving a choice in the care process. The logic processes presented to the user by the computer are more comprehensive and more in line with the current state of the medical art than those which could be preserved in his own memory (pp. 87-88).

The health of the individual is a complex system whose state is manifested by the values of many measurable variables. When a set of variables deviates from it in a recognizable way, "we attach a name to this situation and call it a problem" (p. 85). Silberman's audit sessions (in Walker, Hurst, and Woody 1973) with medical students impressed him that the quality of their workups clearly improved during the 2 or 3 weeks in which they worked with the computerized problem-oriented record on a unit.

Settings and Services

Walton's (1973) overview of the computerized problem-oriented system stated that the CPOR is being used at the Baltimore Public Health Service Hospital and at the Brunswick, Maine, Naval Air Station Dispensary. Quasi-problem-oriented systems are used by Octo Barnett, Harvard Community Health Plan, Cambridge, Massachusetts; and Shannon Brunjes, Community Health Care Center Plan, New Haven, Connecticut. Brown and Morgan (1973) presented the specifics of the development of

a computerized operative report for medical menisectomy.

Studies Regarding the Computerized Problem-Oriented Record

Brown and Morgan (in Walker, Hurst, and Woody 1973) sent the computer program for the menisectomy procedure to a group of 392 randomly selected orthopedic surgeons. These surgeons were asked to evaluate the level of importance of the items. In addition, the surgeons were asked to submit dictated reports for analysis and comparison with the computer program. Twenty-five reports were randomly selected from this group, and 25 were randomly selected from the records of the Medical Center Hospital of Vermont. Frequent omissions of important information and inclusions of unnecessary detail occurred in the dictated reports.

Schmidt's (1974) investigations regarding a computerized system, based on the problem-oriented record and used at the Brunswick Air Naval Station, Maine, showed that physicians spent a longer time (12 rather than 10 minutes) with each patient. A comparison of 318 manuals and 113 computerized records of patients with acute urinary tract infection showed dramatic results. Many more laboratory tests, IVP's, and consultations were required for the "paper record" patients than for the computerized-record patients. The patients who received care under the computerized system received many more simple, appropriate tests than the paper record group. Conversely, the paper record group received more "higher order" procedures in terms of trauma and expense (IVP's and consultations). Krismer and Cordes (1970) investigated the care received by five intensive-care patients under a computerized problem-oriented format. Traditional charts were maintained. Simulated studies demonstrated that accuracy and efficiency of care increased with the computerized problem-oriented system. No numerical results were reported.

E. NURSING AND THE COMPUTERIZED PROBLEM-ORIENTED RECORD

Introduction

Saba and Levine's paper (1976) outlines general concepts regarding the use of computerized record systems--primarily as applied to public health agency use. They provide a brief background of the development of information systems from verbal through written, printed, and four generations of computer systems. The four basic modules of information were presented for use in community health. These would seem no less

applicable to hospital settings, although the specific information included would need to be altered to fit the setting. Statistical information, billing information, patient assessment, and service evaluation components are described. The goals of the PROMIS system include all four of these aspects. In addition, the PROMIS goals include the potential for gaining valuable information from the interactions between these components of an information system.

Experience With the Computerized Problem-Oriented Record

Two articles were identified with regard to the use of the computerized problem-oriented record in a nursing care setting. Both were written by Donna Gane, who was the head nurse on the Ob-Gyn unit at the Medical Center Hospital of Vermont, where the computerized problem-oriented record was in use from July 1970 until November 1974. Gane (1972) is the major proponent of the computerized problem-oriented record for nursing care. In her article in The Problem-Oriented System, she described the use of the CPOR on the Ob-Gyn unit at the Medical Center Hospital of Vermont and described its advantages in providing care.

Four terminals were used by all staff members to enter and to retrieve data. The patients completed the computerized data base prior to admission. This provided an opportunity to begin a relationship between the nurse and the patient and to answer the patient's questions about the impending surgery. The computerized problem list was printed for each patient and used as a worksheet for planning and delivering care. A terminal in the operating room provided information regarding postoperative orders while the patient was on the way back to the unit. The computer provided the potential for relieving nurses of managerial functions. It also taught organization, logic, and fact. Patient education was one of the areas in which the computer was of greatest value. A printout of discharge orders was provided to the patient prior to discharge. The patient profile which was used is included. Vital signs, appearance, cooperativeness, mental state, activity, typical day, and present medications are among the items listed. Space is provided to record (type in) the nursing care plan.

In a more recent article in Your Health Care and How To Manage It, Ms. Gane (1975) focused primarily on the issues related to unit management and the development of the system from this point of view. The computerized problem-oriented record was an aid to the nursing staff. It facilitated their work, while often making the work of the physician more demanding. (For example, operative reports were entered on the computer immediately after surgery, while the patient was on the way back to the unit.) The tasks of unit management, coordination of services, paper flow, etc., were greatly facilitated by the computerized system. Nurses used the problem list and the computer software ex-

tensively, and as a result, asked more questions of the physicians. This was often perceived by the physicians as being inappropriate.

Nursing contribution to the development of the system occurred both by direct development of specific sections and by continued feedback to the PROMIS Lab. Although there are no separate sections on nursing, some sections are used more by nurses than by members of other disciplines. Content developed by nursing includes:

1. Nursing goals, procedures, and plans by body system (plans).

2. Subjective and objective data for postoperative patients (progress notes).

3. Preoperative and postoperative teaching for gynecology procedures, diabetic teaching, breast self-examination, and catheter care (progress notes).

With regard to audit, the computer adds the following advantages to those of the POR:

1. Correct form is facilitated by computerization;

2. Legibility is guaranteed by the computer;

3. Thoroughness is enforced by computerization (p. 105).

"The computer has the potential ability to catalog and correlate data to determine patterns and trends, to formulate statistics which will be helpful in studying effects of care on whole populations" (p. 105). "The challenge . . . is . . . to have the insight and vision to 'reorder our loyalties and responsibilities, learning how to embrace technology and control it so that we can turn idealistic concern . . . into constructive action'" (Weed, "Technology Is a Link, Not a Barrier for Doctor and Patient," 1970).

F. SUMMARY AND CONCLUSIONS

1. Nursing is a complex, goal-directed activity. The goal of nursing is the facilitation of health and the reduction of the negative impact of disease on the clients of its services. Nursing strategies include consideration of the nurse, the client, their interaction, and the environment. Each contributes both needs and resources to the care process.

2. The nursing components of patient care provide one method for the analysis of the activities of nurses on behalf of their clients. They are defined differently by various authors, but may be considered

to include the following elements:

1. Information gathering,

2. Organization of information into meanings--assessment,

3. Establishment of goals,

4. Planning strategies to meet goals,

5. Intervention,

6. Evaluation.

These components of the nursing process are consistent with a general systems approach to goal-directed behavior.

The complexities of human needs and resources, however, do not fit the general systems approach to behavior directed to a single, static goal. Human needs and resources are many, varied, and constantly shifting as they interact with each other. As a result, the nursing components of patient care cannot be considered as consecutive steps in behavior. Rather, they too must remain in constant interaction with each other if they are to adequately reflect the complexity and flexibility of the human needs that they have been designed to meet.

3. The problem-oriented record is a method for the organization of patient information and patient care information. This was first published by Weed during the 1960's. It emphasizes a form of recording which is organized into four components:

1. Data base,

2. Problem list,

3. Initial plans,

4. Progress notes:
   a.) Subjective updating of the data gathered,
   b.) Objective updating of the data gathered,
   c.) Assessment,
   d.) Plans.

The central meanings of this system are "problems" (anything that requires management). Plans and patient responses to these are organized according to problems. The goals of this system include increasing the visibility of:

1. The interaction of the patient's problems;

2. The patient's response to treatment received;

3. The quality of care, including:
   a.) Thoroughness,
   b.) Reliability,
   c.) Analytic sense,
   d.) Efficiency of the providers of care (Weed 1972).

The bulk of the literature regarding the POR falls into three categories: (1) descriptions of the system, (2) assets of the system, and (3) applications of the system to various settings and services. Studies regarding the problem-oriented record indicate that:

1. Many physicians were not familiar with the system in the early 1970's (Iverson and Yarnall 1972).

2. More problems were identified when the POR was used than when it was not (Aranda 1974, Narang 1973, Gledhill 1973).

3. Auditability was not shown to be improved by the system when the factor of legibility was controlled (Fletcher 1974).

4. Physicians who respond to questionnaires are generally favorable to the system (Campbell and Cooper 1973, Asp and Brashear 1973, Gledhill 1973).

5. No difference was found in the length of time required to identify, treat, or resolve the problem of anemia when the problem-oriented system, as opposed to a traditional system, was used (Switz 1973).

The main asset of the system is the organization and visibility of patient care information. Greatly decreased duplication of laboratory services resulting from lost or misplaced laboratory results was documented (Aranda 1974). Another study directed to medical education indicated that the experience of using the POR for audit procedures increased students' facility at data collection and recording according to the POR format (Margolis, Sheehan, and Stickley, in Walker, Hurst, and Woody 1973).

4. <u>The problem-oriented record has been adopted by nursing for care in a variety of settings and services</u>. Literature regarding the use of the POR by nurses and for nursing care falls into the same three major categories as that of the POR in general. Descriptions of the system, its value, and its initiation and application to various settings and services constitute the bulk of the literature. Studies regarding application of the POR in a nursing education setting show that those students who have been taught the use of the POR have greater facility in problem identification in a clinical setting and greater adherence to the content of the POR format (Mitchell and Atwood 1975). Other studies (Savett and Good 1973) show that more patient problems were identified and better documentation of nursing care occurred when

the problem-oriented system was used (Thoma and Pittman 1972, Foss 1974, Bertucci, Huston, and Perloff 1974). Improvement in patient care was perceived by the nurses who used the system (Asp and Brashear 1973) and increased work satisfaction and improved self-image occurred with the use of the POR by nursing (Savett and Good 1973).

5. The computerized problem-oriented record adds to the value of the POR by increasing the speed and amount of information which can be gathered, organized, and distributed. The potential for research, accountability, and public education is great. Concepts, philosophy, and descriptions of the CPOR constitute the bulk of the literature regarding this constantly developing system. Studies of the CPOR and closely related systems document the validity of the frames developed for the menisectomy procedure (Brown and Morgan, in Walker, Hurst, and Woody 1973) and show the value of the CPOR in relation to acute urinary tract infection. Completion of more basic procedures and fewer higher order procedures (IVP consultation) were conducted for patients after the initiation of modified CPOR (Schmidt, Schall, and Morrison 1974).

6. The computerized problem-oriented record has been used by nursing in only one care setting. This setting was the Ob-Gyn unit of the Medical Center Hospital of Vermont. Two articles report the experience of Donna Gane, who was head nurse on the unit at the time.

7. The problem-oriented record is largely compatible with nursing process approaches. Goodness of fit is greatest in the areas of information gathering, assessment, and planning, and although present, is weaker in the areas of goal setting and intervention.

Conclusion

In theory, nursing process is largely compatible with the computerized problem-oriented record. The basic organization of the problem-oriented system is largely compatible with nursing process approaches. Addition of a list of relevant assets (Mazur 1973), inclusion of goals (St.John 1973), and provision of a format for interventions (Bloom 1971) would complete the areas needed for congruence with professional nursing approaches. However, goals and plans by nurses can show sound, analytic sense only if they are made for patients' problems which nurses manage, rather than for medical diagnoses. Documentation of the linkage between nursing care problems, nursing plans, and patient responses has implications for third-party payment. Some current applications of the system provide a barrier to such a linkage by closing the opportunity to document nursing activities for patient problems which require nursing management. The use of the system in public health agencies does allow independent recording by nurses and can facilitate third-party payment for nursing interventions (Davis 1977).

The computerized problem-oriented system offers a unique opportunity to gather, organize, and distribute patient information and patient care information. Individual and group accountability, and research regarding the multiple factors which contribute to disability, would result. As a consequence, public education would be enhanced, and a more intelligent distribution of resources could occur (Cantrill, in Hurst and Walker 1972). To maintain the value of the problem-oriented record as a constructive tool for patient care, it will be necessary to:

1. Recognize the needs and resources brought into the care situation by all aspects of the system--the nurse, the client, their interaction, and the environment.

2. Use the problem-oriented system in a manner which is congruent with a basic accountability to patients and families.

3. Maintain the awareness that the POR or the CPOR is a means, rather than an end, in patient care (Kramer 1972).

LIST OF BIBLIOGRAPHY ITEMS BY CONTENT AREA

A list of Bibliography items, organized by content area, is presented on the following pages. It is intended to assist the reader to identify sources of information regarding a particular content area. Those articles relevant to a specific content area but not reviewed in the text have been included in this list of items.

The first column is an item number from the bibliography which follows this section. It is intended to assist the reader to locate an item with its full facts of publication in that list. The second column gives the name of the primary author of the work. Only the first author of any listing is given in the interest of space. The Index of Authors which follows the Bibliography includes citations of secondary authors. Articles by anonymous authors are listed alphabetically in the bibliography according to the first major word of the title.

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